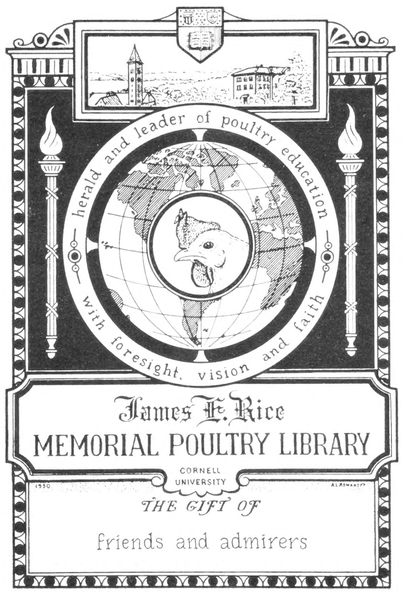

"KELLERSTRASS WAY"

OF BUILDING

POULTRY HOUSES
BROODER HOUSES
INCUBATOR CELLARS
COOPS AND APPLIANCES

"THE KELLERSTRASS WAY"

—OF—

BUILDING POULTRY HOUSES

Brooder Houses, Incubator Cellars, Coops and Appliances

By ERNEST KELLERSTRASS

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PREFACE

IN preparing the following Plates and Descriptions, it has been the aim of the author to give to the new beginner, the farmer and the experienced poultry breeder, a book of Plans and Specifications for Poultry Houses, Incubator Cellars, Brooder Houses, Coops, and Appliances, gotten up in such a clear and concise way, so that anyone, with the slightest knowledge of the use of carpenters', masons' or concrete workers' tools, will be able to build any of the Houses or Appliances described and illustrated.

The Drawings or Plates are intended to illustrate in full every Building or Appliance, and gives Plans, Elevations, Sections, Details and enlarged Details, Isometric or Perspective Sketches, and for each House, Article or Appliance is given a Thumb Sketch in pen and ink, as it appears when finished.

The Descriptions are more than specifications; a specification telling only the kind of material that is to be used, and only sometimes, the manner of using it. These Descriptions intend to take everything up in full, commencing with the Bill of Materials, giving the exact quantities of materials required for each House or Appliance, and then describing in full how to go about to excavate or level for your building, how to mix and pour your concrete, lay brick or stone walls, how to cut the lumber and set up the frames, and secure the other materials, such as roofing, poultry wire, canvas and other items too numerous to mention herein, and they also tell how to install a complete Hot Water Heating Plant, giving lengths and sizes and descriptions of everything necessary to set this up.

All of the Descriptions and Material Bills intend to provide for your locality, so you can select the material that is most suitable and easiest to obtain in your section of the country, and the most of them tell how you can substitute lumber and materials you have laying around your place, so by using that along with the new stuff, you will not need to purchase so much new material, and in many cases, you can build the smaller Houses, Coops and Appliances so that they will cost next to nothing, except for the time and labor you put in, wihch will be cut down to the minimum if you follow the part of the Descriptions entitled, "How to Proceed with the Work."

The space in this Preface is too limited to allow of going over each part of this work, telling what it illustrates and describes, so the author refers you to the List of Contents and then to the pages and Plates following.

Before coming to the actual Plates and Descriptions, the author has written a few paragraphs under "Introductory," intended for those who are not familiar with materials and tools, and the reading of plans, giving a short resume or description of such materials and tools as will be required to do the work shown by the Drawings, and described in that part of the Description telling how to go about the work, and several notes about the Work itself, which will prove useful to the novice. The part about the Materials, giving the sizes and the kinds of materials that can be used in the work, and the part about Tools, giving a list of them and notes regarding same.

Every set of Plates, containing complete Plans, Elevations, Sections, Details, etc., is intended to be complete in every respect, and each Description, containing complete Bills or Lists of Materials, Specifications and directions about How to Proceed with the Work, and other General Notes, is intended to be complete in every way, so that each set or part will be complete in itself, not depending on some other part to give information that might be required to successfully carry the work to completion.

But regardless of this fact (if you have all the parts, making the complete book) it would be well to look over all the Drawings or Plates illustrating any other Buildings, House, Coop or Appliance, resembling the one you contemplate building or making, and also glance over the Descriptions for same; for the author has tried to describe several different methods of proceeding with the work, so the builder will not be confined to one staid method, but can select the one that will suit him and the surrounding conditions best. This, of course, could not have been done for each and every House or Appliance, for it would take up entirely too much space, so the author attempted to alter the methods as much as possible in the different Houses, Coops, etc., that are similar.

It also would be a good idea to look over every Drawing, and read through every Description in the book, and you will find valuable notes that you can apply, not only to this work, but to other work about your farm or suburban or city home, including many notes, as stated in a previous paragraph, in regards to Laying Out Buildings, Excavating, and Leveling, Carpentry, Brick, Stone and Concrete Work, Heating, Roofing, Painting, Hardware, and many other items that will come in handy, to know at many times.

The author wishes to state that this Book of 15 Parts (16 Parts with the introductory matter) illustrates and describes the Poultry Houses, Incubator Cellars, Brooder Houses, Coops, Brooders and Appliances, as built and used on the **Kellerstrass Farm** at Kansas City, Missouri, and that each Part illustrates and describes each House, Coop or Appliance as now built, and in use on the above Farm, except for an alternation or two in some of them, to make a slight saving in lumber and material, and so that they can be built to advantage at a very slight expense in any locality.

The author also wishes to refer you to the practical Book, **"The Kellerstrass Way of Raising Poultry,"** in which you will find photographs and engravings of the Houses and Appliances, as in use on the **Kellerstrass Farm,** and if you wish, you can compare the Thumb Sketches and other Drawings in this Work, with the Engravings in the above mentioned Book, and you will at once **recognize them.**

The author has not attempted to tell completely how to use the Houses, Brooders, Appliances, etc., illustrated and described in this Work, although a few hints are given, space not allowing more complete articles on the use of them, but the author again refers you to the above mentioned book—**"The Kellerstrass Way of Raising Poultry,"** which gives in detail the manner in which the houses and appliances are used, and the methods employed to raise and breed the Celebrated **Kellerstrass Strain of Crystal White Orpingtons,** the Big Egg Laying Strain, which are reared and bred in the Houses, Brooders, etc., and with the aid of the Appliances illustrated and described in this Work. The book on **Poultry Raising** also tells how the **Kellerstrass Way** of building Poultry Houses, Brooders, Appliances, etc., developed, through years of practical experience, to the excellent and ideal Houses and Appliances they now are.

As we are all subject to errors and as there might be typographical or other errors in this Work, the author and publishers will be grateful to any of those who may run on some such error in reading and studying this book, if they will kindly call his or the publishers' attention to same, so that they may be corrected before the next edition goes to press, and also for suggestions toward making the Work as a whole more complete.

The author and publishers also wish to give due credit to Mr. Ernest O. Brostrom, who carefully measured the Houses, Coops and Appliances, etc., and then in a painstaking way, prepared the Plates or Drawings used in this work, and who rendered valuable assistance in the preparation of the Bills of Materials, and Descriptions, and who has given his best efforts to prepare the Drawings in such a way that anyone, though not accustomed to the reading of Plans or Drawings can build the Houses, Brooders, Appliances, etc., illustrated, according to the Drawings or Plates, as if they were experienced mechanics.

Finally, the author desires to state, that he has tried to provide Plates and Descriptions for all the Poultry Houses, Incubator Cellars, Brooder Houses, Coops, Brooders, and Appliances, that are used on the **Kellerstrass Farm,** and that the Drawings and Descriptions are not theoretical, for as above stated, the Houses, Appliances, etc., are built and in use on the Farm, and the hope of the author is, that this Work which he believes to be the most complete and really the only one of its kind in the world, will find its way into the library of every person interested in poultry, whether beginner, farmer, fancier or breeder, and even into the libraries of those whose interests in poultry end at the dining table, to whom this Work will prove of interest on account of the wealth of information in regards to Building and Materials, Tools, etc., enclosed between its covers, no pains or expense having been spared to make the Book as complete and perfect as possible.

Ernest Kellerstrass.

CONTENTS

ABOUT MATERIALS.

The following paragraphs, as stated in the Preface, are intended for those who are not familiar with ordinary Building Materials, (for the experienced builder, contractor, etc., these would not be necessary, but this Work is for the people, and not for an exclusive or certain class), and the author hopes that they will be of some assistance to the intelligent purchasing and use of those materials mentioned and described.

Lumber will be taken up first, as it is the material most used in the Poultry Houses, Brooder Houses, Coops and Appliances illustrated and described in the following pages.

There are many kinds of lumber, as many kinds as there are species of trees, and the most common in this country for common work is Pine, Spruce, Hemlock and Fir; the Pine seemingly being used the most for the largest number of purposes, although in some localities it is not the cheapest. The Poultry Houses on the **Kellerstrass Farm** are built of common Yellow Pine lumber, but in your locality, perhaps, the Hemlock or some other kind of lumber is the least expensive, so use it, but be sure not to get some kind that might snake itself off the place, as Cottonwood has been known to do when left in a pile out in the open, sometimes getting wet, and then dried out rapidly by the sun, warping it, until it sometimes nearly doubles itself. That kind of lumber, of course, is no good, so use lumber that is known to be all right and most commonly used in your locality.

All lumber is cut and sold in even lengths, as 10, 12, 14, 16 ft., etc. When the following Material Bills or Descriptions tell you to get extra long pieces or lengths, it means that, if possible, get a fraction of an inch longer than the even feet, in most cases they state the necessary extra length. The lumber is not always cut exactly on the dot, so this in many cases can be secured. Where the Descriptions say to get such a size full to measure, it means to get it as large as possible, and as close to the nominal size possible. The actual size being less than the nominal, as stated hereinafter.

All rough lumber is measured by the foot, board measure, (B. M.), one foot being the equivalent of a piece of board 1 ft. square and 1 in. thick. All lumber is sold by the nominal size, that is, what it is when first cut or sawn in the rough, regardless of the fact that it generally is quite a bit scant of the nominal size.

Framing Lumber or Dimension Stuff is commonly sawed in sizes such as 2x4, 2x6, 2x8 in., etc., up to 16 in. wide, the thickness varying 2, 2½, 3, 4, 6 in. and on up to 14 in. timbers, though such are very rarely used. This lumber is all sawed that size in the rough, but as it is generally sold surfaced one side and one edge, (surfaced means dressed or planed off), the actual dimensions are from ¼ inch to ⅜ inch scant, and on the larger sizes, ½ in. scant of the nominal size. The 2x4s being 1⅝x3⅝ in. and the 2x6s are 1⅝x5⅝. These two latter sizes of Dimension Stuff are to be used in the Houses following, per the Drawings and the Descriptions.

Common Boards are from ¼ to ½ in. scant, ranging from 4 in. up to 12 in. or wider in width, and the 1 in. boards when surfaced one or two sides, (S 1 S or S 2 S), are 13-16 in. thick. For use in the Appliances and Coops and Brooders, Frames and other such places, get S 2 S boards. The S 1 S boards are good enough for the places where they are to be used for roof boards or something in that line.

Shiplap is made with a rabbet or rebate on each edge, with one facing toward each side, and are constructed so that when the boards are put together they will lap each other and turn water. This is shown and indicated on several of the Plates or Drawings. Shiplap is made in even sizes, from 6 in. up to 12 in. and is 13-16 in. thick and about ⅞ in. scant in face width. The size used in these houses, etc., is 1x8 in. and is 13-16x7⅛ in., that is, presenting a face 7⅛ in. wide, the tongue or lip of the rebate projects up about ½ in. as shown on the Drawings.

Instead of using Shiplap for the walls of these Houses you could use **Barn-Siding,** if you wish, which is the same size as Shiplap, but it is not the same shape, and for this reason, it will not do all the work that Shiplap will do, and therefore Shiplap is recommended and shown

Flooring is made with a groove, along one edge and a tongue on the other, and when the pieces are put together, the tongue of one fits into the groove of the next piece. Ordinary flooring is made 3, 4 and 6 in. wide and presents a face ¾ in. shy of that, and the 1 in. Flooring is 13-16 in. thick, thus making a piece of 1x6 in. Flooring 13-16x5¼ in.

Ceiling is made with a tongue and groove same as the Flooring, but it has two beads worked in the face side, one in the center and the other on the tongue edge, and has a slight bevel on the groove edge. It is made ⅜, ½, ⅝ and ¾ in. thick, each being 1-16 in. scant, and the same width as Flooring, thus a piece of ½x4 in. Ceiling is 7-16x3¼ in.

Common Lath is about 1½ in. wide and ¼ in. thick, though they as a rule fall shy of this, and they are all 4 ft. long and are sold in bunches of 100 to the bunch.

For **Moldings** such as the Drip Molds and Screen Molds, etc., specified in some of the Descriptions, get a standard Molding Book from a Mill or Lumber Yard, which gives all kinds and shapes of stock moldings, that is, moldings that are carried in stock at all times.

These Books also contain lists and sizes of glazed **Sash,** etc., that you can use to select from, in purchasing those required for the work shown on the following Drawings.

All the different species and kinds of lumber are Graded, that is, put in classes, the best being in the No. 1 or A. Grade, the next in No. 2 or B. Grade, and so on down the line, some species of wood or lumber requiring more Grades than others. For this work we would advise using the No. 1 or A. Grade, that is, the best standard grades, although the Dimension Stuff could in some cases be No. 2, for studding, etc., but not for joists, so it is best to get all of a good grade, so you will not get them mixed up, The roof boards could be a lower Grade, where they are to be covered with Roofing, although no loose knots should be allowed, but as a whole, it would be well to get all No. 1 or A. Grades, so that the Poultry are well protected, even in that respect. The best being none too good for producing good egg layers and fine appearing birds, both for table use and show room purposes.

For those who might desire to use **Shingles** in the construction of their Poultry Houses, a few words will be said about them. The best Shingles are those made of cypress, redwood or cedar in the order named, and pine shingles come next; spruce is not suitable for good work. Shingles are between 16 and 18 in. long and range from 2¼ to 14 in. wide and are put up and sold in bundles containing about 250 Shingles each. They should be laid 4 or 5 in. to the weather, that is, with their butts exposed that much, and in placing them, be sure not to get any joint or crack above the one below. Nail them fast with 3-penny (d) shingle nails. If laid 4 in. to the weather it will take about 1,000, or four bundles, to cover a square, that is, a space 10x10 ft. or 100 square ft., and if laid 5 in. to the weather, it will take about three bundles to cover a square.

The above finishes the Lumber, describing the several different kinds and shapes that are specified in the following Drawings and Descriptions, and now the other Materials will be taken up.

While the Lumber is still fresh in mind the **Nails** will be mentioned, which as you all know are used to secure the lumber together with. There are many different kinds and shapes of Nails, but only the ordinary wire Nails will be mentioned herein, which are now commonly used, the cut and wrought Nails now being seldom seen except when tearing down an old building.

For nailing the heavier woodwork, use **Common Nails** and for the lighter work, use **Finishing Nails,** as stated in the Descriptions and marked on the Drawings. The Finishing Nails are thinner than the Common, that is, made out of smaller gauge wire, though they are of the same length as indicated in the following table, giving the sizes, lengths, etc., of a few of the Nails, such as are required in the latter work. The sign (d) means penny, and the number before it, indicates the size, which are as follows:

	Common Nails.			Finishing Nails.	
Size	Length Inches	Gauge	No. to pound	Gauge	No. to pound
2d	1	15	876	16½	1351
3d	1¼	14	568	15½	807
4d	**1½**	**12½**	**316**	**15**	584
6d	**2**	**11½**	**181**	**13½**	309
8d	2½	10¼	106	12½	189
10d	3	9	69	11½	121
20d	4	6	31	10	62

Then there are 5, 7, 9, 12, 16, 30, 40, 50 and 60d or penny Nails.

The 3d **Fine Nails** are 1⅛ in. long, 15 gauge, 778 to the lb., and the 3d **Shingle Nails** are 1¼ in. long, 13 gauge, 429 to the lb.

The gauge of these nails is the same as for common wire, which runs from 00 to 32, the smallest number representing the largest diameter, and the larger number the smallest size.

Brads differ from the other nails only in their heads and points, and they are made in lengths less than 1 in., ordinary lengths being 1, ⅞, ¾, ⅝ and ½ in.

For securing the corrugated sheet iron as described in Parts following, use **Galv. Nails** which are made the same size as the Common above, except

that they are galvanized and have a washer provided.

Tacks are made polished, tinned, blued or coppered, and following are a few of the sizes:

Title Ounces	Length Inches	No., per lb.
1	1-8	16000
1½	3-16	10666
2	1-4	8000
2½	5-16	6400
3	3-8	5333

And then they are made 4, 6, 8 oz., etc., up to 24 oz.

Screws are made of iron, steel, brass, copper, bronze, etc., the ordinary Screw being made of iron, and are made in almost any desired finish and with 25 different shaped heads. The sizes of screws are designated by the length in inches and the number of the gauge, the length varying from ¼ to 6 in., varying by eighths up to 1 in., quarters up to 3 in., and halves up to 5 in.; the gauge numbers run from 0 to 30. The most common heads are the flat and round, either of which can be used in the work described in the Descriptions following. The bright and the blued finishes are the most common.

The small **Staples** for the poultry wire should be galvanized the same as the wire, but do not necessarily have to be. The smallest kind, about ¼ in., comes in papers of 100 each and common galvanized Fence Wire Staples come in sizes ½ in. with about 600 to the lb.; ¾ in. with 480; 1 in. with 360; 1¼ with 200, and 1½ with about 95 to the pound.

You all know what common diamond mesh **Poultry Netting or Wire** is, so no lengthy description of that should be necessary. It should be made out of steel wire, galvanized after weaving. It is made with three different sized meshes, 2 in., 1½ in. and 1 in.; the 1 in. being mostly used on the Poultry houses, etc., hereinafter described, and the 2 in. being used on the **Kellerstrass Farm** for fencing. The 2 in. mesh is made in widths, 12, 18, 24, 30, 36, 42, 48, 54, 60 and 72 in., the 1½ in. the same, except the 54 in. width, and the 1 in. is made in the same sizes up to and including 48 in. It comes in bales or rolls of 150 lineal feet.

Square Mesh galvanized wire **Netting or Cloth** is made in sizes No. 2, 3, 4, 5 and 6, each No. indicating the number of meshes to the inch. No. 4 being ¼ in. mesh with 4 meshes to the inch, making 16 meshes to the square inch. It is made in widths 24, 30 and 36 in. It is put up in rolls of 100 lineal feet and half rolls of 50 feet.

Canvas or common white Ducking is made in 8, 10, 11½, 14 and 16½ oz. weights, and in some kinds in 6 oz. weight (the weight being figured on the 28 in. width) and in widths varying by 2 in. from 28 to 40, varying by 4 in. from 40 to 60 and 6 in. up to 72 in., and then by the foot to 120 in. The lighter weight is the one specified for the partitions, etc. Heavy Muslin might do for some of the smaller work, but of course, the Canvas is much stronger and will last longer.

Canvas is used considerably for roofing, and if you so wish, you could use one of the heavier grades for that purpose, tacking it fast first and then wetting it thoroughly, and before it gets dry, give it a coat of paint, and when that coat has dried, paint it twice or three times more, leaving plenty of time between each coat. This makes a good tight and durable roof, and can be walked on without injury.

Ready Roofings are made in such a great variety that it is impossible to mention any of them herein, except possibly the Asbestos Roofing, of which there are also several brands on the market, and which we recommend because they are fireproof, but at the same time, all the better Ready Roofings have more or less fireproof qualities about them and the best kinds making that one of their chief qualifications. These roofings are commonly put up in rolls in 36 in. widths, containing sufficient to cover one square, allowing for laps or a total of 108 square ft., each roll contains sufficient nails and cement to lay it, (these are packed in the center of the roll). The particular advantage of these roofings is that no previous experience is required for laying them. They are applied by lapping the strips about 2 inches with a coat of cementing material between, and nailing every 2 or 3 inches with roofing nails, which have tin caps.

Building Papers, Felts, Quilts, etc., are also manufactured in a great number of varieties and brands, too many to herein mention. Asbestos building paper is used on the **Kellerstrass Farm** on account of its non-conducting qualities, although many of the other brands have the same qualities and will do as well. These papers are put up in rolls, in 32 and 36 in. widths, and the different varieties vary in the quantities, such as 100, 125, 250 and 500 square feet to the roll, and the weight or thickness of all of them vary.

Corrugated Iron is made of sheet iron or steel and can be had in the black sheet or painted, and galvanized. The metal used varies in thickness by U. S. standard sheet metal gauge. The most common corrugations used are 2½ in. 1¼ in. and ⅝ in. though 3-16 and 2, 3 and 5 in. are made. The 2½ in. and 1¼ in. corrugations are specified in the following work. The 28 gauge is most used for all purposes, although they are also made from 16 to 28 gauge, the 16 gauge being the heaviest,, or about 1-16 of an inch; the 28 is about 1-64th thick. The sheets are in 6, 7, 8, 9 and 10 ft. lengths and in some localities longer lengths can be gotten. The widths of the sheets are as a rule 26 in. or 24 in., as they are called, which is the distance between the centers of the outer corrugations. The black or painted sheets are generally painted with a red mineral paint. The galvanized sheets are the best.

Tin is made of soft steel or wrought iron plates, covered with a mixture of lead and tin. The thicker this coating of lead and tin, the better the plate or Tin is. There are a number of varieties or brands on the market. The common sizes of Tin plates used are 14x20 in. and 20x28 in., and are made in two thicknesses, I C and I X, the latter being the heaviest.

Galvanized Iron is sheet metal that is galvanized and nearly all have a steel base. There are several brands and qualities of these. Galvanized sheets come in lengths 6, 7 and 8 ft., and in gauge numbers varying by 2s from 14 to 30, and is made in widths 24, 26, 28, 30 and 36 in.; some gauges have other widths. 27 gauge iron is also made, which is extensively used.

A few notes about **Glass** may not be out of the way here. Common Window Glass is technically called sheet or cylinder glass, being first blown into the form of a cylinder and then flattened. It is graded according to thickness in two grades, Single Strength (S. S.) and Double Strength (D. S.), the latter being about ⅛ in. thick and the former may be as thin as 1-16 in. Then the glass is sorted into three qualities, AA, A and B, the best being AA, The regular sizes vary by inches up to 6x16 in. and by even numbers up to 60x70 in. for D. S. glass, and 34x50 in. for the S. S. Then besides the common glass, there is Plate Glass, Figured Glass, Wired and Prismatic Glass. The Plate Glass is the highest grade of glass made, and may be gotten as large as 12x16 ft., the average thickness is from ¼ to 5-16. The other kinds will not be mentioned herein.

Paint is such a large subject that very little about it can be said herein. The solid ingredient or part of the Paint is called the pigment and is a fine powder; the liquid part is called the vehicle; this is usually linseed oil, with sometimes a little turpentine added; in enamel the vehicle is varnish, and in kalsomine and cold water paints, it is a solution of glue or some such cementing material, which is dissolved by the water. White Lead and White Zinc are the common white pigments. The tinted or colored pigments are too numerous to mention herein. Linseed oil is either raw or boiled, the boiled oil is mostly used, it drying much quicker than the raw. Dryers are used to make the paint dry rapidly. Too much of this makes the paint lack durability.

The Priming Coat of Paint is the first one applied and should be thinned when it is to be used on wood, but should not be thinned for metals. Outside work should receive two or three coats, and before applying, be sure that the work is clean and free from dust and dirt. Allow about 5 to 6 days for drying between each successive coat. More suggestions about the mixing and application are given in the Descriptions following.

Ready Mixed Paints are now commonly used, even by experienced painters, so these can be used on the work, avoiding the necessity of mixing your own paint. These are made in many varieties, for all purposes too numerous to mention, and they can be had in almost any color or tint. They come in half pints, pints, quarts and gallons, and in larger and smaller quantities according to the purposes for which they are intended to be used.

Whitewash is made by slaking fresh lime in water, adding enough water to make it about the consistency of thin cream, and is applied with a brush in the same manner as paint, although when used in large quantities, it is sometimes sprayed on with a machine or pump for that purpose.

The **Hardware** to be used on the work is to be common Wire Hooks and Eyelets, Door Hasps and Hinges, and these can be selected out of any catalogue containing that class of hardware. The sizes of the Wire Hooks are generally specified small, and the other Hasps and Hooks you can select to suit yourself. The sizes of the Hinges are all given and are the outside measurements of them as they lay open. The square Hinge sizes being from outside to outside, the Strap Hinges giving approximately the length from tip to tip, and some the width across the joint, and the Tee Hinge sizes give the approximate measure from the tip of the tee to the outside of the square edge and the width at the joint.

All of this Hardware as well as the Nails, etc., Sheet Metal and Roofing, and even some of the Lumber, can be found illustrated and shown in the

Catalogues of Builders' Supply Houses or Hardware Dealers, and in some Mill or Lumber Books, and illustrations of nearly all this material is shown in the Catalogues of the great Mail Order Houses in this country, so you can easily find pictures of the several different articles and materials, so if you cannot understand these notes, you will readily understand the pictures.

The common materials used for BRICK, STONE and CONCRETE WALLS you all should know something about, and how they are used, and then those that are to be used in this work are taken up and described thoroughly in the Descriptions in the parts following, so that any further description herein should not be necessary, but for the convenience of those who have had no previous experience in this line of work, a few notes will be given.

A few notes on **Excavating** will be found under "About the Work," so nothing will be said here.

Stonework is done in many ways and many varieties of walls are built, the simplest and most common being Rubble, which is described in a following description. Besides the plain Rubble there is the coursed Rubble, then there is Ashlar work of many kinds, which is squared stones laid up in different ways, and cut work, which is the finest kind of stone work done; but there is too much to say about them to attempt any full description herein. Rubble work is commonly measured by the perch and Cut Work by the square or cubic foot, depending on the kind. The perch is almost universally 16½ cubic ft., although this varies in different localities, 22 cubic ft. being used in some places and 24¾ in others. A ton of most stones will make from 1 to 1¼ perch.

Bricks may be classified as follows: Common, Face, Fire and Paving Brick, and are made of clay and shale, and lately, cement and sand, and Sand Lime Brick have been put on the market. Bricks are made by hand and machinery, though machinery having now almost entirely replaced the hand work, except in very small plants. They are also classified as soft mud, stiff mud, dry pressed and re-pressed, depending on the method of manufacture. The pressed Bricks can now be gotten in almost any color, the common are generally of a reddish hue. The size of bricks vary in different localities, the average is about 8x4x2¼ in. and the thickness of the walls measure about 9, 13, 17, 21 or 22 in. and so on. The size of common Brick also vary in each lot according to the way they are burnt and stacked in the kiln, etc. Common Bricks probably average about 4½ lbs. each in weight, while the pressed average 5 or 5½ lbs. Besides the regular standard brick, other shapes are also made and they may be obtained glazed or enamelled in several different colors. Bricks are sold and estimated by the Thousand (M). Using the average sized common brick, it will take 16½ to 17 2-3 bricks to the cubic foot of wall.

Cement Blocks could be mentioned here, although they are not recommended for water-tight work, unless they are exceptionally well made. If they are carefully made, they will make as good a wall as the other materials mentioned. These are almost exclusively used in some localities, brick and stone being entirely too expensive for common work, so if such is the case in your locality, they can be used in preference to the other walls. These vary so much in shape and size that no descriptions of them will herein be attempted. They are made for 8, 10, 12 and 16 in. walls, and in some places 6 in. blocks are made, and all are made hollow to keep out as much moisture as possible.

The **Mortar** for laying these walls up in is thoroughly described in other parts following, so nothing further will be said herein, although a few notes in reference to the Materials used will be given.

Cement is made in so many brands that it would be impossible to mention any herein, for if such should be done, it would be said that partiality had been shown to the mentioned brands. In selecting your Cement, select a brand that has stood the test, and that has a reputation for good work. There are two kinds of Cement, the Natural Rock and Portland or artificial Cement, the Portland being the kind recommended for use in this work, as it is acknowledged the best. Portland Cement is made with several different materials, such as clay, chalk, marl, powdered lime stone (carbonate of lime) or siliceous sand and slag, depending on the variety of cement, thoroughly mixed and then burned in a kiln in a high heat, and some requiring to be ground into a fine powder. As indicated above, there are three varieties of artificial cement, True Portland, Silica Portland, Puzzolan, and there are several brands of each and all good, though some are especially recommended for special kinds of work.

Portland Cement should be of a greenish gray color and the weight varies from 77 to 95 lbs. per cubic foot, the average being 85 to 90 lbs. It should be so fine that 95 per cent will pass through a sieve of 2500 meshes to the square inch. The strength of cement made into briquettes composed of one part cement to three parts of sand, seven days old, should be from 100 to 140 lbs. and neat cement briquettes (which means cement alone without sand), should break at seven days, at from 250 to 550 lbs. A barrel of Portland Cement is supposed to contain 3½ cubic feet; when put up in sacks each sack is supposed to contain 95 lbs., or four sacks to the barrel.

Lime is chemically known as a metallic oxide, or prot-oxide of calcium. It has a great affinity for water and will rapidly absorb 22 to 23 per cent, or about one-fourth of its weight, passing into the condition commonly called slaked lime, or chemically called, hydrate of lime. It is made by heating limestone to a red heat in air, which leaves the Lime; this process is called, Calcination. Slaking is the process of adding water to the lime, to make lime paste. A good lime will make over 2½ times its original bulk of lime paste for mortar, and of course will make considerably more whitewash than that. All limes should be given at least two days to slake in, and others requiring more, the poorer kinds even taking months before all the lumps are slaked. Such lime should not be used. It is shipped either in barrels or bulk, a barrel weighing about 220 lbs., and when in bulk, it is sold by the bushel of 80 lbs., 2½ bushels or 200 lbs. being considered equal to a barrel.

Sand is obtained from banks or pits, river beds and the seashore. All Sand should be clean, free from earth and vegetable matter and the sea Sand should be thoroughly washed to remove any alkaline salts, which cause efflorescence when used in brick work. Pit or bank Sand is generally considered the best for mortar, although the other Sands are extensively used. The Sand should be sharp and angular, giving a firm hold for the Cement or Lime. Sand is used in mortar to prevent shrinkage and to save Lime or Cement. Too much Sand of course weakens the mortar. The Sand should ordinarily be screened. For common brick work a No. 6 or No. 4 sieve being all right, and for rubble work a ⅜ mesh sieve is all right. For finer work, finer sieves are used, so as to eliminate excessive gravel or stones. The grains should not be even in size, especially in rubble and concrete work, a mixture of fine and coarse sand being best. The average weight of damp Sand (not wet) is about 96 lbs., the dry being of course lighter. It is generally sold by the cubic yard, but sometimes by the load, an average load containing 1¼ yards, although sometimes as much as 2 yards are loaded on.

Concrete is made by mixing Cement or Lime and Sand with broken Stone, Gravel, Cinders, fragments of Brick, etc., (these latter items called the Aggregate), and Water, and when mixed is poured into Forms or moulds and left there to harden into practically artificial rock. It is now used for walls, columns, floors, etc., in all the better classes of larger buildings and even in small residences, as well as in bridges and for foundations and sidewalks. It is really the best and most adaptable and durable building material of the age.

The manner of building the **Forms** and of **Mixing,** etc., is all thoroughly described in the following Descriptions, so nothing will be said about that herein. Portland Cement is the best for all uses and Lime is very seldom if ever used any more for Concrete. Concrete when made right becomes so hard and strong that when pieces are broken off, the line of fracture passes through the stone or other aggregate used. Notes on Cement and Sand will be found above and the different materials used for the Aggregate, which should not be in larger particles than a large sized hen's egg, is thoroughly described in the Parts following, so only a few additional notes will be given here.

The proportions of Sand and Cement to the Aggregate should be such, so the sand and cement will fill the voids. This varies with the size and kind of aggregate and with the coarseness of the sand. The proportion specified for the following work is 1 part Cement to 3 parts Sand, to 6 parts Aggregate, which will be found plenty strong for any ordinary work, although in some cases, the concrete is mixed as strong as 1; 1 and 2. Be sure and mix it thoroughly, for the mixing is an essential part in the making of Concrete, the amount of water to be added is a subject over which engineers still argue, so you can use about the amount stated in the Descriptions following, not getting it either too dry or too wet. The weight of Concrete varies from 130 to 140 lbs. per cubic foot, according to the material used for the Aggregate, stone Aggregate making the heaviest Concrete.

Reinforced Concrete or Concrete Steel, as it once was called, is not used in any of the following work, but a definition of it will be given. It is an approved, that is, strong concrete mixture, reinforced with steel rods or bars of any shape, so arranged and combined with the concrete so as to take up all the tension or pull and the shearing stresses, and leaving the crushing part to the concrete, and in many cases, wire netting is used, including common barbed wire and other common fencing, which is made extra strong. In beams and floors the reinforcing is placed near the bottom of the beam or slab, and in columns it is run both vertically and circular, and

in walls both ways, arranged so as to give the whole the required strength. In this combination the Concrete is used for buildings and bridges, etc.

Such other items as **Steel Pipe Columns** and other **Piping, Anchors, Bolts** and other items not mentioned in this introductory matter are all described in the various Descriptions in which they occur, and also the materials and appliances for the **Heating Plant** is described in the Part covering same, so it will be unnecessary to make any notes about them herein.

This closes the Material portion of the Introductory Remarks, and the author hopes, as stated in the first paragraph, that same will be of some use in doing the work specified and described in the following Descriptions and shown on the Plates and Drawings.

ABOUT TOOLS.

For the convenience of those whose vocation in life does not make it necessary to familiarize themselves with common Tools, a list of those that will come handy in the following described and illustrated work, will be here given, with a few additional remarks. This does not necessarily imply that each and every Tool named is necessary in the work, but the author has tried to make the list as complete as possible, so as to include the names of all Tools in common use. Illustrations and descriptions of all these Tools can be found in Hardware Catalogues or in the Catalogues of such Firms that handle Tools.

For Excavating get a
Wheelbarrow for hauling,
Shovels,
Spades, and a
Pick, if the ground is hard.

These ought all to be found on any farm or suburban home, and they would even come handy for the city dweller.

A small **Scraper** would be handy in the larger Excavating, and in the Leveling work, and then
Shovels and a heavy iron
Tamper can be used.

For Setting Fence Posts, etc., get a
Post Hole Digger or
Auger.

For Driving Posts or Stakes, etc., a
Iron Maul or
Sledge or **Heavy Hammer** will come in handy. This can also be used if you strike rock in your excavating, in which case, you will need a
Stone Drill or two, and some
Blasting Powder and **Caps.**

For Lifting and Prying, a
Crow Bar or two can be used to advantage.

For Cleaning away Grass, and Cutting Weeds, etc., a
Scythe or
Sickle can be used, and for these, get a
Sharpening Stone.

For all the Leveling, Masonry, Carpentry, etc., you will need a
Tape Measure,
Rule (2 ft. or more),
Steel Square,
Mason's Plumb and Level, and perhaps a
Plumb Bob.

For Laying the Work Out, get a
Mason's Line or Cord, which is about No. 4½ or 6.
A Chalk Line Reel will come handy.

For the Stone Work, you will need a
Stone Hammer,
Trowel or two, and a
Stone Chisel will come in handy.

For Laying the Brick, get a
Trowel or two, and a
Brick Chisel or
Brick Hammer, and for fine work,
Pointing Tools and
Pointing Trowels are used.

For Mixing Mortar, etc., a
Shovel or two and a
Hoe or two will be handy, and a
Mixing Box will be necessary.

For the Concrete Work, the
Shovels and
Hoes will be necessary, and a
Tamper or **Rammer,** and a
Wheelbarrow or
Buckets for transporting it from the
Mixing Platform, and then a
Trowel will be necessary for finishing the top of the walls.

For the Top Coat Work, or Cement Floors a
Smoothing Trowel or **Surfacer** is used, and if you wish grooves, a
Groover will have to be used.

For Sidewalk Work, the above Tools and an
Edger and
Roughing or **Line Roller** are used.

For Sheet Metal Work
Shears or **Snippers,**
Hammers,
Soldering Coppers,
Resin or other acid **Flux,**
Solder which comes in bars,
Scrapers or **Cleaners** and a
Lamp or **Stove** for heating are used.

For Handling and Securing the Poultry Wire and Fencing you will need a
Hammer,
Nippers,
Pliers or these in a **combination tool,** and a
Wire Stretcher will be handy in building long fences.

For Pipe Fitting, for installing the drain pipes, you will need a
Monkey Wrench
Pipe Wrench and an
Earth Auger and a
Calking Tool will come in handy.

For installing the Heating Plant, in addition to the above you will need a
Pipe Vise or **Bench Vise,**
Pipe Cutters,
Stocks and
Dies and
Taps for threading,
Reamers,
Pipe Cement or **Red Lead** and an
Oil Can.

For the carpenter work
Hammer with claws, a heavy and a light one being handy, a
Hatchet comes in handy many times,
Ripp Saw,
Cross Cut Saw, a coarser and a very fine, thin one being useful,
Key Hole or **Compass Saw,**
Mitre Saw and a
Mitre Box can be used. And a
Saw File, and
Saw Set, and
Saw Vise for sharpening the Saws.
Block Plane used for cross grained ends,
Smoothing Plane and a
Jack Plane for large surfacing and truing of edges.
Bench Stop can be used if you make a bench. Then there are
Rabbet or **Rebate Planes,**
Circular Planes,
Molding Planes,
Bull Nosed Planes.
Scrapers are used for extra smooth work.
Chisels in various sizes from ¼ up to 2 in.
Corner Chisels V shaped and
Gouges from ¼ in. up to 2 in. These can all be gotten in sets.

Wooden Mallet,
Draw Knives,
Spoke Shaves,
Braces.
Bits varying from 3-16 to 1¼ in., smaller ones being called
Gimlet Bits and
Drills, which can be gotten in very small sizes.
Extension or **Expansion Bits** are used for holes 1 in. to 4 in.
Hollow Augers for use in ordinary braces ,
Screw Driver Bits,
Bit Gauge for gauging the depth of the hole,
Counter Sinks.
Hand Drills or **Combination Tools.**
Nail Sets and
Punches,
Screw Drivers and
Files of various shapes,
Marking or **Roller** or **Scratching Gauge,**
Compass or **Dividers.**

Then as before mentioned you will need a
Rule, 2 foot or Extension,
Measuring Tape,
Steel Square and a
Plumb and Level, besides these a
Try Square and
T Bevel. A pair of
Pinchers and combination
Pliers and Nippers will be handy, and a
Monkey Wrench can be used, and for bench work, a
Vise and some
Clamps and then for all the edged tools, an
Oil Stone for sharpening.

For Glaziers Work get a
Glass Cutter,
Putty Knife,
Glaziers Points and **Setter.**

For Painting and Whitewashing, get the necessary
Brushes and a
Putty Knife.

All of these tools are made in several shapes, sizes and varieties, and in different grades, from low priced to high priced, so you have a broad field to select from. Most of these tools, especially those for the carpenter work, are gotten up into sets or kits, which include a tool chest or box and can be purchased that way to advantage.

The reader must not think that all these tools are required to do the work hereafter shown and described, for really the most of the work can be done with a shovel, tamper, level, saw, hammer and a square and rule, others require a plane and a brace and bit, and these tools with the exception of the tamper and level, should anyway be found in every home.

The above almost complete list is given so you can have a variety to select from and also to give the novice an idea of a few of the various tools on the market that is used by the various branches of the building trades, though all of the several different tools, for each branch mentioned, are not found in the kits of every mechanic.

Before purchasing any of the tools, read over the description for the House, Brooder, Coop or Appliance that you intend to build and you will nearly in all cases find the necessary tools mentioned by name, and if not given by name, they will in all cases be indicated or implied by the manner or way of doing the work.

In buying tools, as in buying poultry, it is always best, to get the best, so the author advises you to purchase tools of a good, if not the highest quality, for then you can be sure you have something that will not break or get out of order the first time it is used, thus necessitating a trip to the nearest hardware store to replace the article broken, making it cost in the long run, more than a good quality would have cost in the first place. In edged or sharp tools you will find the better tools hold their edge much longer and better than the poorer grades, and for that reason are much easier and nicer to work with.

But even if good tools are purchased, they must not be neglected or misused, for the best of saws will not keep sharp if you use it to saw through nails with, and no chisel will hold an edge if you use it for a screw driver, or some similar purpose, and a bit that has bored through a piece of lumber and then let go with a chug into the sandy earth underneath, will not do clean work long, so even with the best tools, you must use care and common sense, and no tool should be left out in the rain or over night, so the dew gets on it and spoils it with rust. So take care of your tools and you will always have a clean sharp one to lay your hands on when needed, and then they will last long and give you good satisfaction.

ABOUT THE WORK.

So much has already been said in the two foregoing articles or explanatory notes, and so much is written in the following descriptions about the work, that little is left for this portion, but as cautions and notes can generally be repeated and inserted in many places to advantage, a few will be given herein.

In **Selecting a Plot or Space** for your Poultry Houses, etc., select a place on high ground, so the water will have ample opportunity to run or drain off, so that it does not run in over the floors of the houses, making them damp and wet and unsanitary, which is not the best for the chickens.

But if your Grounds are located so you cannot set the houses on a high place, haul a few loads of earth to the place and tamp it down flat on top, letting it form a small elevation or mound, and on this place the poultry houses. In this way there will be an embankment all around the house, which will drain the water away from the building.

If the houses are built on a side hill you will have to dig a trench around on the high side, to keep the water from pouring in over the floor of the house or coop.

This matter of raising and keeping the floors from being soaked every time it rains is also mentioned in the Descriptions following.

In **Laying Out** the houses, etc., be sure and get all the sizes exactly as marked on the Drawings, and as stated in the Descriptions, and you will have no trouble in any of the future wo·k, and be sure you have got each corner perfectly square and true before leaving same.

Excavating is measured by the cubic yard of 27 cubic feet and is done in a number of ways. The Excavating nd **Leveling** for the houses and cellars, etc., shown in this book, can mostly be done with shovels and spades and a wheelbarrow, but if the earth is hard you might have to use some other means to loosen it. If you strike rock, it will, of course, necessitate blasting, in doing which you should use care.

The manner of laying **Masonry Walls,** Brick, Stone or Concrete is thoroughly described in the following parts, so no further description will be necessary here.

In **Measuring, Marking** and **Cutting** the **Lumber,** measure each length off exactly as per the measurements on the Drawings, and as given in the Descriptions, but at the same time check each measurement with the work as built, so you do not cut any lumber to waste or unnecessarily, and so each piece will positively fit exactly, for the Material Bills do not list any extra or excess lumber. In places where fitting is necessary, or should be done, it is generally so stated in the Descriptions.

In marking the lumber get every mark straight and true and absolutely square where it is supposed to be that, and beveled or sloped correctly, where that is required. Use your rule and square at all times, not doing anything by guess, and where necessary use your bevel.

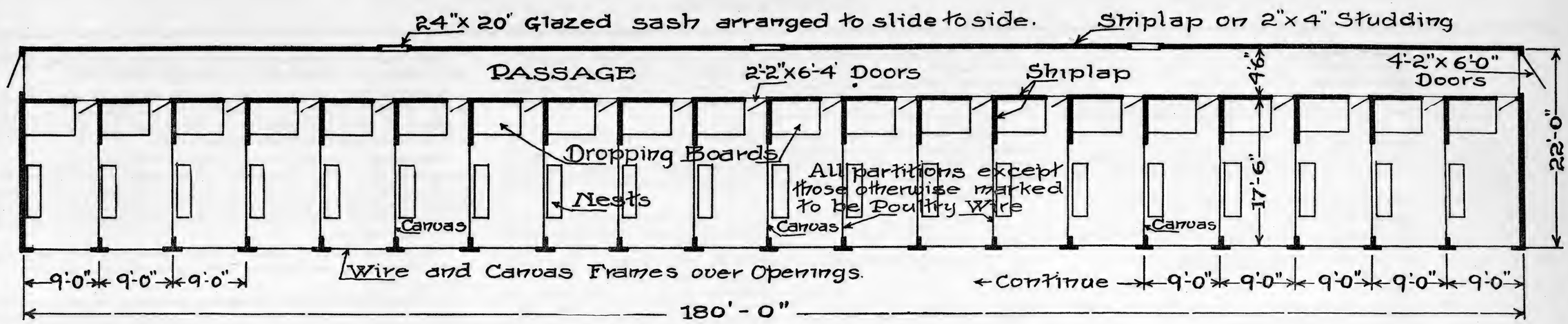
When sawing or cutting it off, make every cut straight and vertical, so every edge will be true and plumb, except those that are to be beveled, which you can saw on a bevel, if you so wish, and then smooth down with a plane.

Do all the Measuring and Marking, Fitting and Cutting with care so that all will fit nicely and neatly, and in doing all this work use good common sense, and you will not have the displeasure of seeing something work out improperly.

The **Nailing,** etc., together of the various pieces of lumber, the **Metal Work,** the **Pipe Fitting** for installing the heating plant, the methods of putting on the **Roofing, Painting** and other **Items,** are all pretty thoroughly described in other parts of this book, so nothing further will be said here.

The chief object in doing **all work** should be to get it done right, so it presents a neat appearance and is strong and substantial, or summing it up in a few words **"Done in a Workmanlike Manner,"** which is arrived at by using patience, care and common sense, and of course experience counts considerably, along with which comes knowledge which can be imparted to others.

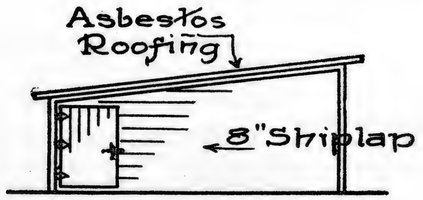
This Work is attempting to do this latter, the author intending for it to impart knowledge regarding the building of Poultry Houses, Brooder Houses, Incubator Cellars, Brooders, Coops and Appliances, that have through experience proved entirely satisfactory and a complete success on the **Kellerstrass Farm,** and also to present a few paragraphs or notes on the materials and work necessary to build these Houses, Coops, Appliances, etc., so they will be as successful as the ones now in use on the **Kellerstrass Farm.**



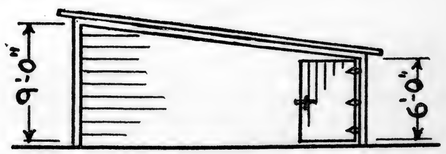
◦ GROUND ◦ PLAN ◦

◦ HALF ◦ REAR ◦ ELEVATION ◦
- NORTH -

◦ HALF ◦ FRONT ◦ ELEVATION ◦
- SOUTH -



◦ WEST ◦ ELEV. ◦



◦ EAST ◦ ELEV. ◦

◦ KELLERSTRASS ◦ PLAN ◦ OF ◦

▲ BREEDING ▲ AND ▲ LAYING ▲ HOUSE ▲

◦ AS ◦ IT ◦ IS ◦ BUILT ◦ ON ◦ THE ◦ KELLERSTRASS ◦ FARM ◦

▲ KANSAS CITY, MO. ▲

PLATE ◦ I ◦

BREEDING AND LAYING HOUSE

(Twenty Compartment)

BILL OF MATERIALS.

2x4 in. Dimension:

2800 sq. ft. 18 ft. long for studs, long sill plates, etc., 271 pieces.
338 sq. ft. 22 ft. long for sloping rafters, sills, etc., 23 pieces.

3608 sq. ft. Total (board measure.)

1x8 in. Shiplap:

7500 sq. ft. 18 ft. long for sides, partitions, etc.
4900 sq. ft. 24 ft. long for roof. If this 24 ft. 8 in. shiplap cannot be obtained or is too expense in your locality get 5000 sq. ft. of 14 ft. stuff.

12400. Total sq. ft.

1x4 in. Boards for 7/8x3 5/8 in. stuff for frames, or this may be 1x8 in. stuff ripped in half.

400 sq. ft., 12 ft. long, 100 pieces.
355 sq. ft., 14 ft. long, 76 pieces.
214 sq. ft., 16 ft. long, 40 pieces.

969 sq. ft. Total.

1x8 in. Boards for nests and for 7/8x2 1/4 in. pieces.

122 sq. ft., 14 ft. long, 13 pieces.

1x12 in. Boards for nests and trap doors in front wall.

364 sq. ft., 14 ft. long, 26 pieces.

1 3/4x1 3/4 in. for roosts or 2x4s ripped in half. Get these as near full to measurement as possible.

94 sq. ft. 14 ft. long or 280 lineal ft. of 2x2 in. stuff.

3 sash 24x20 in. single strength glass, divided 6 lights, 1 3/8 in. thick.

4500 sq. ft. of Asbestos or other good reliable Ready Roofing with nails and roofing cement which generally comes rolled up with the roofing.

The above can all be obtained from any lumber yard.

Poultry Wire:

124 lineal ft. 5 ft. wide, 1 in. mesh, for front frames.
260 lineal ft. 5 ft. wide, 2 in. mesh, for partitions.

384 lin. ft. Total.

The wire may have the same size mesh if preferred, giving preference to the 1 in. mesh.

Light weight canvas, about 8 oz.:

230 yards, 1 yard wide, for frames, doors, etc.

Hardware:

120 5 1/2x3 1/2 in. tee hinges for frames, with screws.
60 spring hinges for canvas doors with screws.
6 9x5 in. tee hinges for outside doors.
2 latches for same with proper fasteners. Any barn door latch or hasp will do.
480 small hinges with screws for nests.
80 eyelets for frames.
80 small hooks and eyes for bottom fasteners.
80 12 in. long hooks and eyes for ceiling. These 12 in. hooks may be made out of common heavy wire, so it will only be necessary to get 80 eyelets instead of the 80 long hooks and eyes.
4000 small staples for poultry wire.
1 lb. 3 oz. tacks for canvas.
25 lb. 20 penny (d) finishing nails for frames.
125 lb. 8 penny (d) common, for shiplap.
45 lb. 10 penny (d) and 15 lb. 20 penny, for framing.

Paint:

6 gallons of ready mixed white paint for the first coat and three more if the second coat is desired.
If preferred get 75 or 100 lbs. paste white lead and 5 gallons of boiled linseed oil and some turpentine and mix your own paint. This will be sufficient for priming coat. Get half as much more material for the second coat.
1 bu. of lime for whitewash.
2 gal. creosote or crude carbolic acid.

HOW TO PROCEED WITH THE WORK.

The building will take a plot of ground 182 ft. by 24 ft., allowing for the overhang of the eaves, and should be located so that the building may face south and should be in a dry place and be level. If the ground is slightly sloping, it will do no harm, but of course a level spot is the best, so we advocate moving a little earth and making it as near flat as possible.

After the ground is levelled and the weeds and so forth are removed, proceed to lay out the building, measuring the 180 ft. off carefully about a foot back of the front line of the plot that has been chosen and drive a stake at each end, so that the inside of the stake will mark the 180 ft. Stretch a line (heavy white building cord or chalk line) from one stake to the other, seeing so that it runs due east and west, or in case you plot of ground is not located quite square with the world see so that the line runs parallel with the outside of the levelled ground. Now after this line or cord is up, measure back 22 feet, using a steel square so that the corner will be true, and drive a stake. Now take another line and stretch it back from the front stake to the back stake, taking care to get the corner absolutely true. Do the same at the other end and you will have 180 feet at the back and the size of the building on the ground.

To prove that the corners are square, measure out 10 feet on the front line and 10 feet on the end line from the corner, and the measurement on the diagonal from one 10 ft. point across to the other should be 14 ft., 1 11-16 in., as near as practical; or measure 6 ft. out on one line and 8 ft. on the other and the diagonal will be 10 ft. exactly.

Now as the building is "staked out" proceed to lay the sill plates. Take two of the 22 ft. 2x4s and twenty of the 18 ft., these for the front and back and the longer ones for the end sill plates. Cut 4 in. off the length of each of the 22 footers and notch four of the 18 footers, making the notches 1 5/8 in. deep and 3 5/8 in. broad, as is shown on Plate IV, "Enlarged Corner of Frames," using 20d nails instead of those marked; this detail being made for the wire and canvas frames. Take two more 18 ft. 2x4s and saw them into 2 ft. lengths to be used on the under side of plate as splices at the joints.

Now lay the end sill plates, now 21 ft. 8 in. long in their proper places and the notched 18 footers joining them at the corners, and the remaining 16 spread between, using the 2 ft. splices to join them together, keeping the ends even and laying all straight with the lines that are stretched between the stakes. These plates to be laid on top of the ground, only the splices going underneath the surface, and all is to be securely nailed with 10d nails at the joints and 20d nails at the corners. Level the plate up, using a mason's level and make it straight and true, using bricks or rocks or other material to raise any low places and scraping away the earth under plate to lower the high places. Be sure and give the plate a solid bearing or foundation, so it can be nailed into without shaking the entire length.

Now space and mark off every 9 ft. on the front plate and every 4 ft. 6 in on the back plate, and the measurements on the end plates all as marked on the Ground Plans on Plates I and II, most clearly shown on Plate II.

Next lay the 2x4 sill plates, using 18 ft. lengths for the bottom of the long partition between the passage and the poultry pens as shown on the Sections, Plates III and IV, and on the Ground Plans. Be sure and get this straight and level and toe-nail together at the joints. This is to be started with a 2x4, 17 ft. 9 1/4 in. long across the first two pens on the east end and then continuing with 18 ft. stuff until the last one is reached. This is done to make the joints come in the center of the 2x4s at the bottom of the cross partitions which are to be laid next, and which are 17 ft. 3/4 in. long, and are to be toe-nailed to the front sill plate and nailed through the long partition sill plate into the end of this cross 2x4. These 2x4s or partition sill plates are set on edge and are to be levelled, and are to be laid straight and at right angles or parallel as the case may be, with the other work and well nailed and to be located as shown and indicated on the Plans and Sections, care being taken to follow the measurements exactly as given, which will guarantee everything working out right without any waste of material.

The sill plates being all laid and all measurements marked on same, get out the studding next. Take thirty-one 18 ft. 2x4s and cut into sixty-one 9 ft. lengths for front studding. Take fourteen more 18 ft. 2x4s and cut into forty-one 6 ft. lengths for the back wall. These studding are to be beveled on the top and as shown on Plate III. Cut four more 2x4s into the proper lengths for the end studding as marked on the Ground Plans, Plate II, and bevel same on top as shown on Plate III.

Now make a couple sloping rafters, using the 22 ft. stuff, to measurements and with bevels as shown on Plate III and while you are doing this and have your bevels set you might as well cut the other nineteen rafters out of the 22 ft. 2x4s and have them ready.

Pick out a couple extra long 2x4s out of the 18 ft. stuff that are as near 18 ft. 7/8 in. long as possible for use on the east end of the upper or cap plate which runs across the front and rear of the building and is marked "2x4 total length of building" in the Section on Plate III. The other eighteen 2x4s to be only 18 ft. long, except the last ones which run across the last two pens on the west end which will have to be about 7/8 in. short. This is done to make the joint come over the center of the sloping rafters, which occur every 9 ft. across the building, as is shown by the drawings.

The framing for the outside walls and roof is now all cut and ready to be nailed together and placed in position.

All partitions are to be built same as the one here shown except that three of them will have canvas over the poultry wire.
The measurements here given are standard for the entire house.
Right end will be the same as this, the left, except that it is reversed.

180 feet over all

9'-0"

12"

12"

2" Mesh Poultry Wire. 2"X4"X6'-1

Drinking Fountain Stand.

1"X8" Shiplap

2'-0"

Trap Nests. See Details to follow.

3'-2"

6'-8" X 5'-6" Canvas Frame on inside and Wire Frame on outside. Both hinged at top.

2"X4" Rafters above

Dropping Board of 1"X8"X4'-4" Shiplap

2"X4"X4'-0⅜" Supports

1¾"X1¾"X6'-3" Roosts

6'-4"

6'-3"X5'-2" Canvas Frame hinged at top.

6'-5⅜" long

Earth Floor.

4'-4"

3'-2"

2'-8"

4'-6"

9'-0"

8'-4¾" long

2"X4" Studs and Plates

7'-9⅝" long

2"X4"X5'-7½" hanger for Drop board, nailed to rafter above.

7'-2½" long.

Canvas

Spring hinges

2'-2"X6'-4" Canvas Door.

6'-7⅜" long

6'-0" long

9'-0" long

12"

1"X8" Shiplap.

4'-2"X6'-9" Batten Door.

4'-6" 4'-4" 4'-4" 4'-4" 1'-6"

22'-0"

• PASSAGE •

Measurements continuous same full length of Bldg

4'-6"

• GROUND • PLAN •

7/8"X1 7/16"X4'-4⅜"

7/8"X1⅜"X4'-4⅜"

7/8"X3⅝"

Same

• INSIDE • ELEVATION •

Enlarged • SECTION •

24"X20" Glass div. 6 lts 1⅜" Sash

7/8"X3⅝"X23⅜" Side Casings.

Head and Bottom Casings 7/8"X3⅝"X2-10¼"

Slide for Sash

PLAN

• DETAILS • of • • SASH • in • • REAR • • WALL •

KELLERSTRASS PLAN OF

BREEDING AND LAYING HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0ft 1ft 2ft 3ft

PLATE • II •

Lay one sloping rafter in position on the ground and place one set of end studdings in their proper places, being sure that they are spaced according to the measurements on the drawings and taking care that they do not slip while they are being nailed in place and be sure that the rafters are nailed on the right side of the studs and sloping correctly. Nail the other end up in the same manner except that the position of the rafter will be different on the top of the studs. Nail a piece of shiplap on diagonally for a temporary brace to hold studs in position. Now you have the frames for the end laying on the ground ready to raise. Next get the front and rear framing ready and then raise it all at the same time.

Lay the extra long 18 footers near the east end and distribute the others along the front and rear, finishing with the shorter one on each side. Now get the studding distributed where they belong. By laying the cap or top plates along the sill plates which is all marked off for the studding, you will have no trouble in getting the studding placed correctly so that they will be plumb when in position. Toe-nail the studs to the cap plate in their proper places securely, but do not nail the several 18 ft. sections together yet, for it would take a considerable amount of help to raise the whole 180 ft. wall at once. Put on some temporary diagonal braces of any piece of lumber, leaving the nails projecting enough so that they may be easily withdrawn when the shiplap is ready to be put on. It would be a good idea to nail these braces on the inside so that they can remain in place until the outside is all boarded up, thus keeping the building stiff and rigid from the very start, so that the nails will in no way have a chance to get loosened by the wind swaying the frame slightly to and fro.

The measurements for spacing the studding are given on the Ground Plan on Plate II and are to be carried out the whole length of the building, that is, the measurements given on that enlarged plan of one of the pens are typical of all the other pens except the one on the west end which will vary slightly.

Now raise the end framing and secure it in position with a brace from the inside of the corner studs down to the inside of the front and rear sill plates, taking care to get everything plumb and straight so there will be no crooked work, and then after the ends are raised, raise the front section closest to the end, bracing it properly with a diagonal brace running down to the cross partition sill plate, and nailing the cap plate to the end sloping rafter and toe-nailing it to the corner stud and toe-nail all the studs to the sill plate. Then raise the rear section opposite the front and put a sloping rafter in position and nail the whole securely together. Raise the next front section in order, putting a brace at the far end of it and nailing the cap plate to the sloping rafter already in place on the other section. Now raise the corresponding rear section and put up another sloping rafter and nail all securely, using the 10d and 20d nails. Proceed with the remaining sections until they are all up and all plumb and all well nailed together, with all the studding in their proper places and half the sloping rafters in place.

Now place the remaining ten rafters in position and nail them well, nailing through the cap plate and toe-nailing into the studding. Each rafter to come immediately above the cross partition plate below as is shown by the Section on Plate IV and indicated on the other drawings.

Ten feet back from the inside of the front studdings measuring along the cross plate, nail a piece of shiplap, upright from the plate to the rafter which at present will serve as a brace and afterwards as a part of the partition. This can be nailed solidly in place and the top sawed off with the slope of the roof or rafters. Use the 18 ft. stuff. This piece is marked "B" on the Section on Plate III. Be sure and get this plumb and on the right side of the partition and the right distance from the front studding, so that the poultry wire will not need to be cut when it is put into place as is shown on the above mentioned Section.

Take forty 18 ft. 2x4s and cut into seventy-six pieces 8 ft. 10⅜ in. long. and four pieces 8 ft. 8¾ in. for horizontal rafters between the sloping rafters. Before cutting all these rafters it would be well to fit one in each pen so as to be sure that there is no mistake in measuring or in laying out the building as a whole. The 8 ft. 8¾ in. lengths are to be used in the west end pen, but don't forget to try one or two, for it will be a considerable waste of material if a rafter should happen to fall shy a half inch or so. Nail these in position, driving the nails through the sloping rafters which can easily be done on both sides by driving the nail in at an angle so as to miss the rafter in place on the side one has to drive the nail from. These rafters should be kept straight and especially the one over the long partition plate which is to form the cap plate for that partition.

These partition studs are 6 ft. 5⅜ in. long, beveled on top, the same as the end studs per Plate III. So pick out thirty 18 ft. 2x4s and cut two studs out of each stick, except the last which you will need only one out of, making a total of fifty-nine studding. Toe-nail these in position, spacing them as indicated on the Ground Plans. Plate II. The pieces that are left from these cuttings will be used later.

Now put in the horizontal 2x4s around the large openings for the wire frames in the front wall. There will be forty pieces 7 ft. ¾ in. long as is marked on the Front Elevation. Plate IV, and twenty pieces 2 ft. ¾ in. long for the short upright or stud under the bottom horizontal 2x4s, per the Front Elevation. These are also shown on the Longitudinal Section on Plate III. It will take twenty 18 ft. 2x4s for the 7 ft. ¾ in. pieces cutting two out of each 18 ft. stick and take ten of the 5 ft. pieces left from sawing the partition studs above and cut into twenty 2 ft. ¾ in. lengths and nail them all in their proper places, as is indicated on the Front Elevation and on the Section. The twenty 3 ft. 10 in. pieces will be used later, there being a place for all these small pieces.

Now put in a horizontal 2x4 forming the upper jamb of the outside doors as shown on the Section on Plate III; these two 2x4s will be 4 ft. 2⅜ in. long and securely nailed at the proper height as indicated on the drawings, remembering that the same is to form the upper jamb for the doors. Use two of the short pieces left from above for this.

Next the roof boards can be put on so as to get the frame under cover. Square up one end of the 24 ft. long, 8 in. shiplap, taking care to get the same end on all the boards so that the placing in position will go on smoothly without any unnecessary breaks. Take four of the shorter pieces of shiplap, those that may not come up within a fraction of an inch of 24 ft, and lay one at each end and the other two equal distances apart in the center, dividing the space into three equal parts. Starting with the east end board, with the inside rebate turned up (the outside rebate to be ripped or planed off before the board is placed on the roof), place it so that the over-hang at the back and at the front will be the same and let it project over the end as far as is possible to get a good hold for nailing and then nail this board securely in place, taking care that the projection over the end is parallel with the wall below.

Now nail your right end board in position making the projection over the front the same as the left end board and project as far as possible over the end to make as large eaves as can be gotten with a piece of 8 inch shiplap. This piece will have the inside rebate turned down, (the outside one being removed the same as the east end board). The two middle boards are to be nailed only temporarily but are to project over the front the same as the ones at the end. Now drive a nail in the end of each of these boards and stretch a line across, this to be used to lay the other shiplap too, so that the front will present a straight edge without having to saw it again. Now nail the other 24 ft. shiplap in place, using 8d nails and place them as close together as it is possible to place them. Take care so that you do not press the line out of true. When you come to the center-line-supporting-boards, remove the nails and place them close to the other boards and then replace the line and proceed till the roof is all covered. Then saw the back ends off in a straight line so no board will project beyond its neighbor.

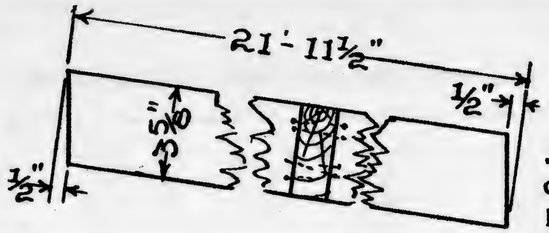
In case you have been unable to get the 24 ft. shiplap and have only the 14 ft., proceed in the same manner as described above, only paying particular attention so that the inside end of the boards will cover only half of the horizontal rafter, so as to leave nailing space for the one below or above depending on which board is put on first. Break joints, starting with the 14 ft. at the top and a 10 at the bottom, and then a 10 ft. board at the top and a 14 ft. at the bottom. Then a 5 ft., 14 ft. and a 5, and so on, so as to use up all the material letting none go to waste. The projection over the front and back of the eaves cannot be as great using the 14 ft. stuff as when using the 24 ft. stuff.

Instead of using shiplap for these roof boards, common sheathing boards can be used, but are not as good as the shiplap, and therefore we recommend the use of shiplap. The quantity of sheathing to be the same as that for the 14 ft. shiplap, in case you desire to use it.

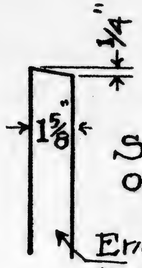
Now nail in place the 8 in. shiplap on the ends, rear and front walls, using the 18 ft. stuff and 8d nails, commencing at the bottom and laying upwards. On the rear leave openings for the windows as shown on Plates I and II, the construction being detailed on Plate II. These openings will be 2 ft. 3 in. by 1 ft. 11 in. In the end leave the openings for the outside doors which are 4 ft. 2 in. by 6 ft. 0 in., as is shown on Plates II and III. In front leave the openings for the frames, etc., as is clearly shown by the Part of Front Elevation on Plate IV, which also gives the length of some of the pieces of shiplap. Follow the drawings carefully in placing the shiplap in position, and across the front and rear do not forget to break the joints. This ought also to be done on the end. To break joints means to nail the shiplap on so that no joint will come directly over the one in the board below.

The outside is now all enclosed, ready for the doors and poultry wire frames, but all the studding is not in place yet for the cross partitions. Take nineteen 18 ft. 2x4s and cut them to a length of 17 ft. ¾ in., fitting them in between the long partition studs and the studs in front, directly above the cross partition sill plate as is shown by the Section on Plates III and IV, and nail in position, making the height 2 ft. 4 in. from the bottom of the sill plate to the top of this cross 2x4 as is clearly shown on a Longitudinal Section. Nail through the vertical piece of shiplap "B" into this 2x4 also.

Now put on the vertical shiplap as is shown on the Section, Plate III, running the shiplap to the roof in back of piece "B" and cutting it 2 ft. 4 in. long in front, nailing it in place solidly, using 8d. nails.

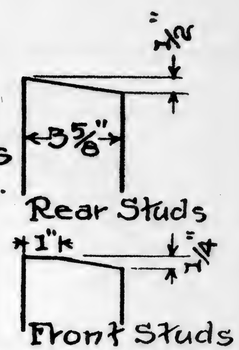


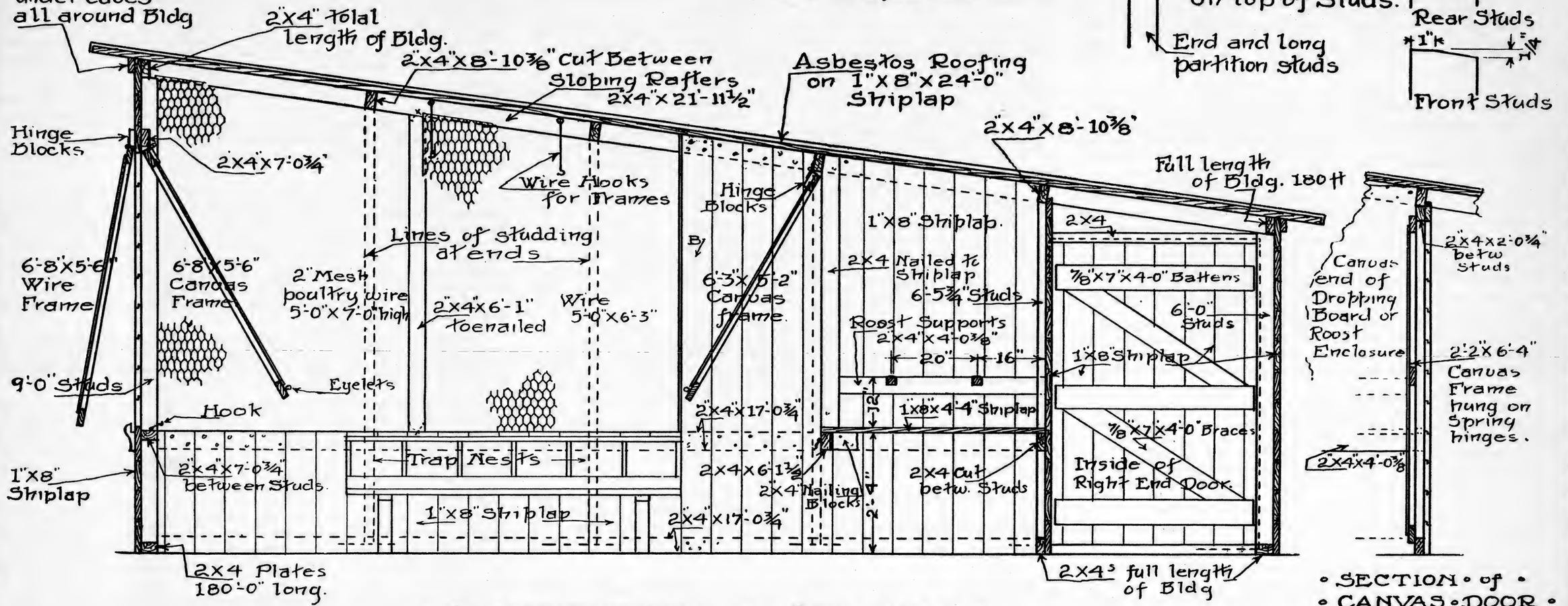
Showing Bevels on 2x4 Sloping rafters.



Showing Bevels on top of Studs.

End and long partition studs





• LONGITUDINAL • SECTION •

Showing Frames swung out from closed position.

• SECTION • of • • CANVAS • DOOR •

KELLERSTRASS PLAN OF

BREEDING AND LAYING HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0ft 1ft 2ft 3ft

PLATE • III •

The upright 2x4s 6 ft. 1 in. long can now be put in place as shown on the Longitudinal Section to form a brace for the roof and also a place on which to secure the poultry wire. These are to be beveled on the top the same as the front studs and toe-nailed into place. Use two or three of the longer scrap pieces you have from previous cuttings and eight more 18 ft. 2x4s, cutting two 6 ft. 1 in. pieces out of each stick, making in all nineteen pieces with beveled tops. This finishes the cross partitions.

The back or long partition is next in order. Take ten of the 5 ft. pieces and cut them into twenty lengths 2 ft. ¾ in., and fit between the studding where the canvas doors are to be, as is shown on the Section of canvas door, Plate III and on the Transverse Section on Plate IV. Now nail the shiplap on, making the ends come flush with the inside of 2x4 studs which form the jambs of the canvas doors. This is to be solid from floor to ceiling as shown, leaving only the necessary openings for the doors.

Now make the outside doors. This will take about six pieces of 18 ft. shiplap. Cut these up into 6 ft. lengths making enough to get the desired width of the door, which is 4 ft. 2 in., and then nail the battens and braces on as is shown on Plate III and which may be made of pieces of shiplap or other lumber that is handy, being careful not to use anything that will be needed later. Be sure and get these doors nailed solidly so that they will have no tendency to sag or get out of shape, and always use the square in marking lumber of any kind so that it will be true and in good shape when put together. Hang the doors with the six 9x5 in. tee hinges provided, three for each door, placing one strap over each batten and drive the screws in firmly and take care so that the hinges are directly above one another so that the door will swing true without binding. Put on the latch or hasp whichever you have provided and the door is ready. A latch or bolt of wood may easily be made but we will leave that to your own ingenuity for lack of space on our drawings.

As the outside door is hung it might be in order to put on the roofing so that the roof will be water-tight or this may be done as soon as all the braces and stiffeners are put in on the inside. These ought to be put in first to eliminate as far as possible any sagging of the rafters that might occur while working on the roof. Apply the asbestos roofing or other good ready roofing, whichever you have bought, according to the directions furnished by the manufacturers and which come with each roll, along with the necessary roofing nails and cement. Commence to lay the roofing at the back, at the bottom of the slope of the roof and lay upwards, laying the roofing lengthwise of the building, and letting the first strip turn well over the edges, and tack it there securely. Now lay the next width of roofing with a sufficient lap as stated in the directions, using plenty of the roofing cement so as to get a good tight job. Continue this to the top and turn the edge of the roofing down over the top edge of the roof boards letting it project below the boards at least an inch so as to make a good drip for the water, so it will not get on the under side of the roof boards and run down and inside the building, rotting out the woodwork faster than it should.

Put on the corner boards and the ⅞x3⅝ in. piece or strip all around the building under the eaves next. Take sufficient of the 1x4 in. stuff or 1x8 in. ripped in two, in 14 ft. lengths to make about 410 lineal ft., to be used for this purpose. Put on the strip under the eaves on each end first, cutting a bevel on each end so that the front and back, which are to be put on next, will fit snugly to same, making a good job. The front and rear strips are to be beveled with a plane, so that they will fit tightly against the roof boards. Take eight pieces long enough to make the corner boards and plane four of these down so that when put together the corner boards will present the same width on both sides, that is, a 3⅝ in. wide face will show both on front and end or rear and end, as the case may be. Nail these together and fit them snugly at the top with the eave strips and let them run clear to the ground and nail securely in place.

Now put on the casings for the rear windows which will take about thirty lineal feet of the 1x4 in. stuff, taken out of the 14 ft. lengths. The sizes for all the casings and slides for the rear windows are given on the Detail for same on Plate II, and while you are working in the rear you might as well fix the windows up complete. Nail the casings on, fitting the joints in a workmanlike manner, then put your bottom slide up which you can make out of any lumber that you may have around, this slide will set one-half inch down from the bottom of the opening in the shiplap, which is already cut and cased. Now place the sash in position and put the upper slide in place, seeing that the sash slides freely without binding. It wouldn't be a bad idea to put the upper slide on with screws, to faciliate removal of the sash if at any time such would be desired.

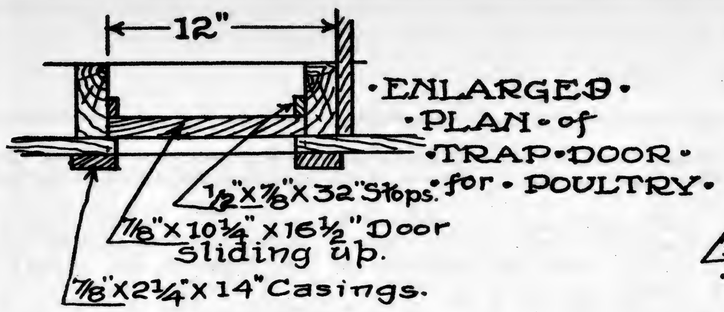
Take one of the 1x8 in. boards 14 ft. long and cut a 6 ft. 6 in. length off of it and then take this piece and four boards, full length, and rip them into strips 2¼ in. wide. Then cut them into twenty strips 6 ft. 6 in. long and sixty pieces 14 in. long. These 14 in. pieces will be used to case the openings for poultry or trap doors as shown on the Front Elevation, Plate IV, and the 6 ft. 6 in. pieces laid aside for use on the nests to be built later. The remaining pieces of the 1x8 in. are also to be used for the nests.

Now put up the dropping board and roosts as shown on Plates II, III and IV. Take ten 18 ft. 2x4s and cut two 6 ft. 1½ in. pieces out of each, making twenty pieces for the front of dropping board and ten pieces that can be used for the 5 ft. 7½ in. hangers and the other ten hangers can be gotten out of three 18 ft. 2x4s and 1 piece of the leavings from previous cuttings. These twenty hangers are to be beveled on the side and top as shown and indicated in the Longitudinal Section, Plate III, for same has to be securely nailed to the horizontal rafter as indicated, nailing through the rafter into the hanger and also by toe-nailing. Take five more 18 footers and cut into four pieces each, 4 ft. ⅜ in. long, making twenty pieces for the end. Now take the twenty 3 ft. 10 in. pieces and ten of the other longer pieces that are waiting to be used and cut them to fit in between the studding of the long back partition as marked on Plate III, and nail them in place at the height shown. Then nail the hangers in their proper places, nailing as stated above, then place the 6 ft. 1½ in. pieces in place, being sure to get it level, and nail through the hanger into the end of same, and nail a 2x4 block (of which there are quite a number left from cutting the 17 ft. stuff), on the cross partition to which secure the end of this front piece of 2x4. Now put the end 2x4 in place, toe-nailing it into position and taking care so that it is square with the front 2x4. That much ready, nail on the shiplap, which will be in 4 ft. 4 in. lengths, and notch it around the studding at the back and around the hanger to make a workmanlike job. Proceed with all the dropping boards in the same way, using the material you have prepared. Take the 5 ft. pieces that are still waiting to be used and nail them as far as they go on the shiplap partition to form a stop or jamb for the canvas frame, and let them rest on the shiplap of the dropping board to make a tight joint at the bottom, and take care to keep them exactly parallel with the hanging 2x4 in the opposite corner. For the remaining fifteen pieces necessary cut five 18 ft. 2x4s into three 5 ft. pieces each and nail these in their respective places. The 3 ft. pieces remaining can be used for the nests.

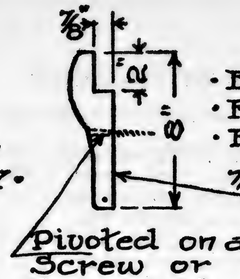
The roosts are to be made of the 14 ft. full to measure 2x4s or the 2x2 in. stuff ordered for this purpose. If the 2x4s were gotten, rip them in two and plane the rough side off. Cut them up into forty 6 ft. 3 in. lengths and round the edges slightly, to about a quarter of an inch radius, and take off all the excessive roughness. The short pieces off the ends to be used for fasteners for the front frames. The roost supports to be gotten out of ten 18 ft. 2x4s, cutting them into four 4 ft. ⅜ in. pieces each. These forty pieces to be notched as shown on Plate III in the Longitudinal Section, making the notches as deep as the roost is thick and of a width to allow the roost to easily be removed. The supports against the walls may be now nailed into place, but do not nail the ones on the canvas end in place, although they may be fitted and made ready so they can be put in when the canvas is tacked in place.

You are now ready for the canvas and wire frames. Starting with the outside wire frames and the front inside canvas frames, which are the same size, take eighty pieces of the 12 ft. 1x4 in. stuff and cut it into eighty 6 ft. 8 in. pieces and eighty 5 ft. 2 in. pieces, after having dressed the lumber down to 3⅝ in. wide by planing the rough edges off. Notch the 6 ft. 8 in. pieces at each end as shown on Plate IV. And be sure that all the cutting is true and square and then nail these together as shown, using 20d finishing nails. Now take the forty 16 ft. 1x4 in. pieces and cut a 4 ft. 11¾ in. piece off of each one and toe-nail these in the center of the frames as is shown on the Front Elevation, Plate IV. There are now twenty frames for the outside and twenty for the inside ready to be hung. Take twenty of the 12 ft. and twenty of the 14 ft. 1x4 in. stuff and cut one 6 ft. 3 in. length off of each piece and then a 4 ft. 10 in length off of each, making forty of each of these lengths. Take twenty of the pieces left from the 16 ft. stuff and cut to a length of 4 ft. 6¾ in. Now notch the 6 ft. 3 in. pieces the same as you did for the other frames and as shown on Plate IV and nail all of the members together in the same manner as before, but making a different sized frame, which is to be used in front of the roost and which is shown on the Transverse Section. Now build the frames for the canvas doors in the same way as the other frames, being careful to get all joints square and solid so as to avoid all inclinations to sag and twist. Take the remains of the forty 16 ft. pieces and cut a 6 ft. piece off of each and from what is left cut forty pieces 2 ft. 2 in. long. From the pieces off the ends of the twenty 14 ft. pieces that have been cut, cut twenty pieces 1 ft. 6¾ in. long. Now notch the 2 ft. 2 in. pieces in the same way as for the other frames and nail the different members together, the 2 ft. 2 in. pieces at the top and bottom, the 6 ft. pieces at the sides, and the 1 ft. 6¾ in. pieces in the middle as shown in the Transverse Section, Plate IV. All this 1x4 in. stuff is to be planed off so that it will be the size marked on the drawings so it will work properly.

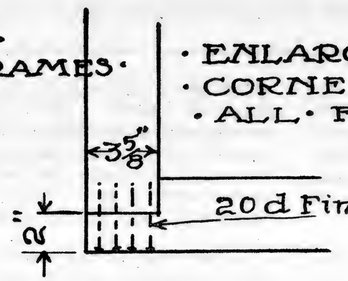
Before these frames are hung, stretch the wire and canvas on them, using the 1 in. mesh wire for the outside frames, driving the staples about four inches apart and make it perfectly taut and put the wire on the outside of the frames. The inside canvas frames to have the canvas stretched on the inner side, with 3 oz. tacks about three inches apart. The roost frames are to have the canvas on the side away from the roosts, fastened same as above and the door frames are to be the same. the canvas being on the pen side of the frame. Do not waste the material as the quantities in the material bill is just enough to do the work.



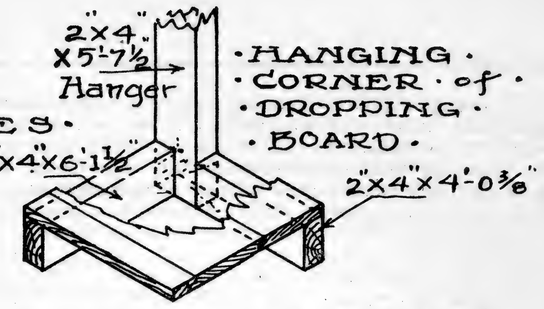
·ENLARGED· ·PLAN· of ·TRAP·DOOR· for ·POULTRY·



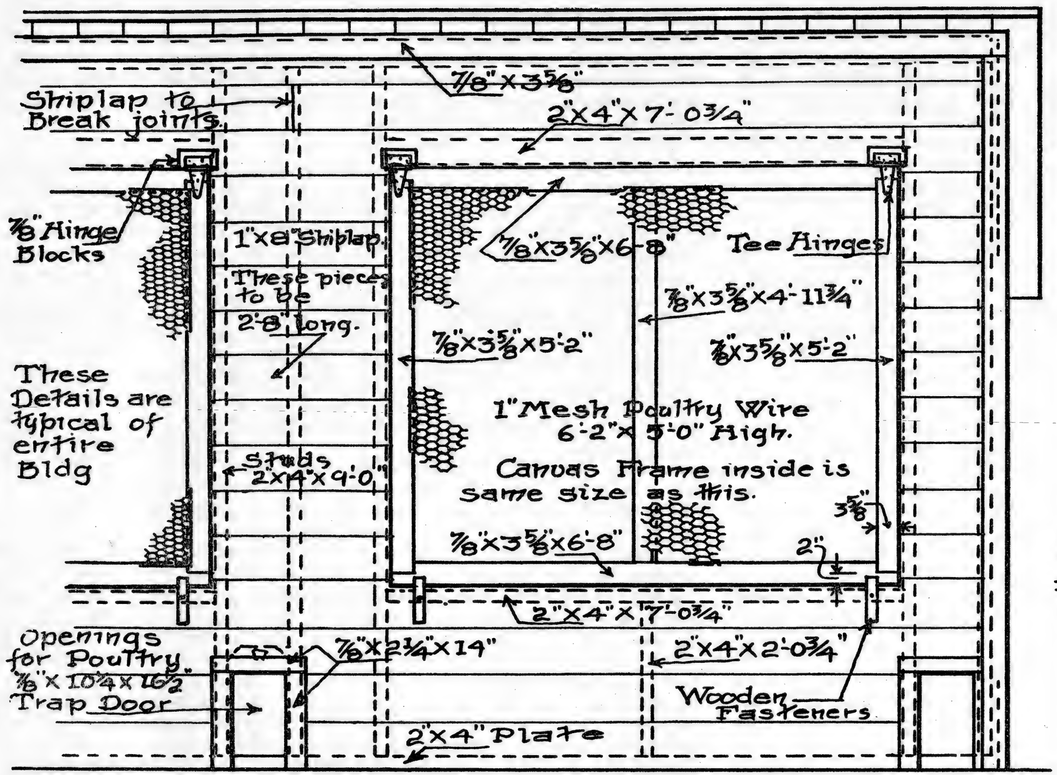
·ENLARGED· ·FASTENER· for ·FRONT· WIRE· FRAMES·



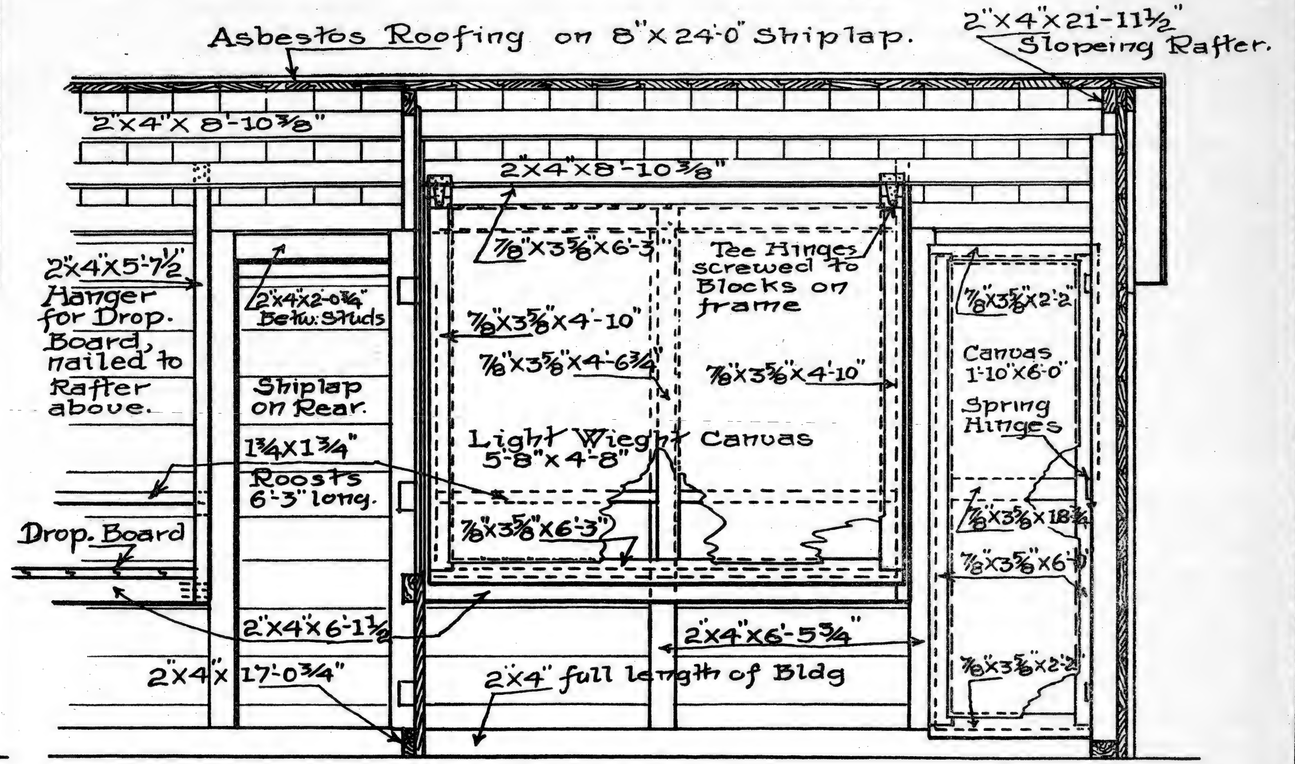
·ENLARGED· ·CORNER· of· ·ALL· FRAMES·



·HANGING· ·CORNER· of· ·DROPPING· ·BOARD·



·PART· of ·FRONT· ELEVATION·



This side Shows Door and Canvas frames removed.

·TRANSVERSE· SECTION·

KELLERSTRASS PLAN OF

BREEDING AND LAYING HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0 ft 1 ft 2 ft 3 ft

PLATE ·IV·

Now from the short otherwise waste pieces off the ends of the 1x4 in. stuff, cut 180 hinge blocks 5 or 6 inches long and nail them in their proper places as is shown on the Elevations and Sections on Plates III and IV. On the outside the hinge blocks are to be nailed on the shiplap, on the inside the blocks are to be nailed to the frames and for the canvas doors they are to be nailed onto the studding as shown. Raise an outside frame in position and hold it there while a helper nails the hinge blocks in place and secures the hinges, using two 5½x3½ in. tee hinges for each frame, taking care that they are put on square so that opening the frame will not wrench them loose, and drive the screws in as far as they will go. Hang all these frames in this manner. On the inside frames nail the hinge blocks in position first and then secure the hinges and put up where they belong, chiseling out the 2x4s a little on which the tee of the hinges are to be fastened if it does not allow the frames to fit tightly against their jambs. The canvas doors are to be hung with three spring hinges each, located as shown on the Section. These spring hinges to be ordinary screen door spring hinges, or if desired common 3x3 in. hinges can be used with an ordinary screen door spring.

The trap doors in front of the openings for the poultry are not in place yet, so take two of the 14 ft. 1x12 in. pieces and cut them up into twenty 16½ in. long pieces, forming the top as shown on the Front Elevation. Now make some strips for stops about 32 in. long, out of any lumber not intended for something else and nail on as shown on the enlarged Detail on Plate IV. Fit the doors in place so they slide freely and drive a nail or eyelet in the top to get hold of, so the door can easily be lifted out.

Now make forty wood fasteners for the front frames as is shown by the enlarged Detail on Plate IV, using the ends off of the roosts. Bore a small hole where shown and use a long screw or nail for a pivot.

Before we get any more hardware on than we have, it would be a good idea to paint the exterior, using ready mixed paint or white lead and oil and giving it a good, not too thick, coat, brushing the paint out well, so that it will not gather in lumps and then blister. It will take about six gallons for the first coat and about three gallons more if a second coat is desired. Paint the outside wire frames both inside and out and treat the outside doors the same, and don't forget to paint the eaves or under side of the roof boards that are exposed.

Put on the hooks and eyes next, in their proper places as shown on the Section on Plate III, each canvas frame to have two eyelets, as shown with the corresponding small hooks at the bottom, on the 2x4s and the long hooks at the top, in the ceiling, to hold same up when open. These long hooks, as before stated, can be made out of common heavy wire, or common baled hay wire will do in a pinch.

The frames have already been covered with canvas and wire so they are done. Stretch the 2 in. mesh wire over the opening in all the nineteen cross partitions, driving the staples about four inches apart and running the wire vertical so it will be only necessary to cut it on the ends as shown on the Section on Plate III. After the wire is all in place, cover the openings in the three partitions marked on the Ground Plan on Plate I with canvas, driving the 3 oz. tacks about three inches apart along all edges. It will be necessary to sew this together or else put in some extra vertical strips at each otherwise would-be seams, and tack the edges of the canvas to this. This is the most practical way to do it. Now stretch the canvas across the ends of the roosting spaces, tacking it on the outside of the 2x4 hanger at the outside corner and on the inside of the stud, as indicated on the Plan on Plate II. The seam here will have to be taken care of in the same manner as described above, except that the wood strip will run horizontally. It will also be necessary to nail a strip at the top, sloping with the roof, to secure the upper edge of the canvas to. These strips do not need to be over 2 in. wide and can be ripped out of any lumber left over. Now as the canvas is up across the end of the roost the second roost supports can be nailed in position, nailing through same into the studding at the wall and toe-nailing it into the 2x4 hangers. The roosts can also be laid in place.

The building is now about completed except that the inside is to have a thorough coat of whitewash, which is made by slaking fresh lime, adding enough water to make a thin paste. Three-quarters to one bushel of lime will make enough whitewash for the inside of this building. By using two pounds of sulphate of zinc and one pound of salt to each half bushel of lime the whitewash will be much harder and not crack, although these latter items are not necessary to make good whitewash.

The roosts and top of dropping boards are not to be whitewashed but are to receive a coat of creosote or crude carbolic acid, enough to thoroughly saturate the wood.

While this is being whitewashed, proceed to build the trap nests and drinking fountain stands, which are completely detailed on Plate V. These are also to receive a thorough coat of crude carbolic acid or creosote, both inside and out. The brackets supporting the nests may be whitewashed.

Take ten of the 14 ft. 1x12 in. boards and cut into twenty 7 ft. pieces. The fourteen other pieces of 1x12 in. stuff, cut up into 140 pieces 16½ in. long, for partitions and ends. These are to be notched as shown for the ⅞x3¼ in. front pieces. Take twenty of the remaining 1x4 in. 14 ft. stuff and cut a 7 ft. piece off of each and dress these down to 3¼ in. wide, to be used for the fronts of the nests. Now nail these members together with 8d nails, and put the bottom on of shiplap all as shown on the Details. The top is to have loose covers as indicated on the drawings, which are to be made of shiplap. Take the remaining pieces of shiplap and cut twelve 17½ in. lengths for each set of nests, making a total of 240 pieces for all the nests. Place these together in pairs and secure them with a couple of cleats as shown on the drawings. These cleats are to be about ⅞x1½ in. and about 13⅛ in. long, or just large enough to fit snugly between the partitions. After the cleats are on in their correct places, as shown on the drawings, dress or rip the covers down to 14 in. wide and fit them in place.

Now take what is left of the 1x8 in. boards and cut 120 pieces 13⅛ in. long for the trap doors. Trim these down to the proper size to fit nicely and cut the semi-circular hole near the bottom as shown, and they are ready to be hinged. Take the small hinges provided and using two to each door, hang the doors in place, keeping the outside face flush with the front face of the partitions, etc., and flush with the front cleats on the covers which should be flush with the front. Place the hinges on so the doors will swing in, as indicated on the drawings and screw them fast to the top edge of the door and to the underside of the cleat without housing them in. Oil these hinges so they will swing easily and fit the doors so that there will be a slight opening all around same.

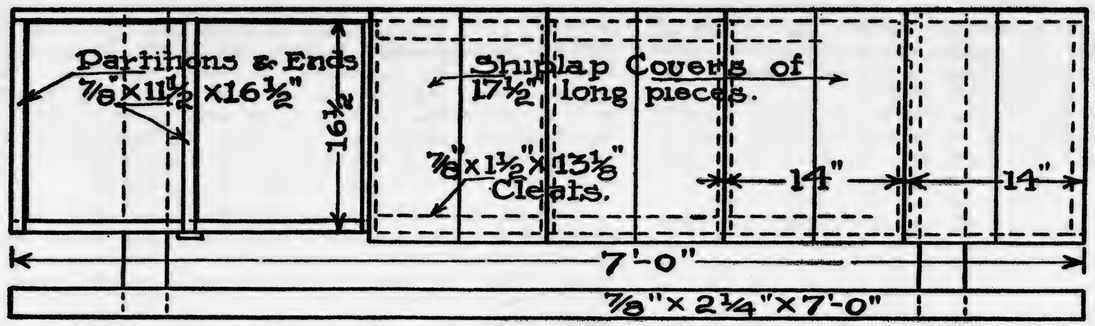
Whittle out of pieces of common laths or other strips about ¼ in. thick the pieces for the pivoted pins or triggers as shown on the drawings, making them the proper lengths, as indicated on the Section, to hold the door up as shown. Make the upper end of these sticks or pins about square and the other rounded and then in the rounded end bore a small hole so it will fit loosely on the nail. It will take six of these for each set of nests and after they are ready nail them fast to the partitions in the position shown on the drawings, placing them just low enough so that the doors will clear them nicely when they swing down. If necessary, cut a notch out of the corners of the doors, so they will drop down or close, all right. Make a small indentation on the door to help hold the pins up in place until the hen enters, and touching the doors lightly with her tail feathers, lifts the door slightly and the pin drops down releasing the door, so it swings down into the closed position.

On the outside ends of the partitions, as shown on the drawings, nail a piece of common lath or other strip to form a stop for the doors so they will not swing out. These also serve to hold the covers in, from any forward movement, so they will have to be raised up before being removed. These pieces can be nailed on all the partitions if you wish, instead of as shown. In letting the hen out, just lift the covers up and the door which is hinged to it, will of course follow. This also makes it easy to clean the nests, for when the covers are removed there are no tops or high fronts to prevent getting into the nests properly. Instead of lifting the whole cover to let the hen out or to get the eggs, just push the door in without removing the top or cover. The hinges on these doors can be replaced by other means of hanging that may be better and allow of freer swinging of the doors, but that will be left to your own ingenuity.

The remaining pieces of 1x4 in. stuff and short pieces of the 2x4's are now to be sawed up to make the brackets to support the nests as shown on Plate V. Build these solidly and nail them securely to the wall in the position shown on the drawings, then take the twenty ⅞x2¼ in. x 6 ft. 6 in. long strips that you have already cut and laid aside for this purpose and round the upper edges slightly and nail into position as shown on the drawings and set the nests on top, not nailing them.

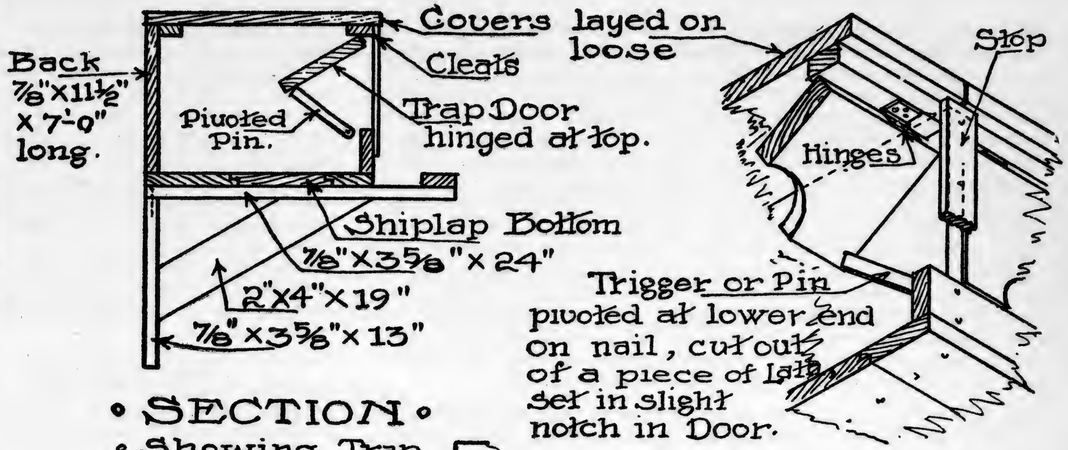
Now take the scrap pieces of 8 in. shiplap or other 8 in. stuff and make twenty fountain stands as shown and nail these against the wall and where shown on the several different drawings.

Coat these articles with creosote or crude carbolic acid, as stated before, and touch up with whitewash and the building is ready for it's feathery occupants.



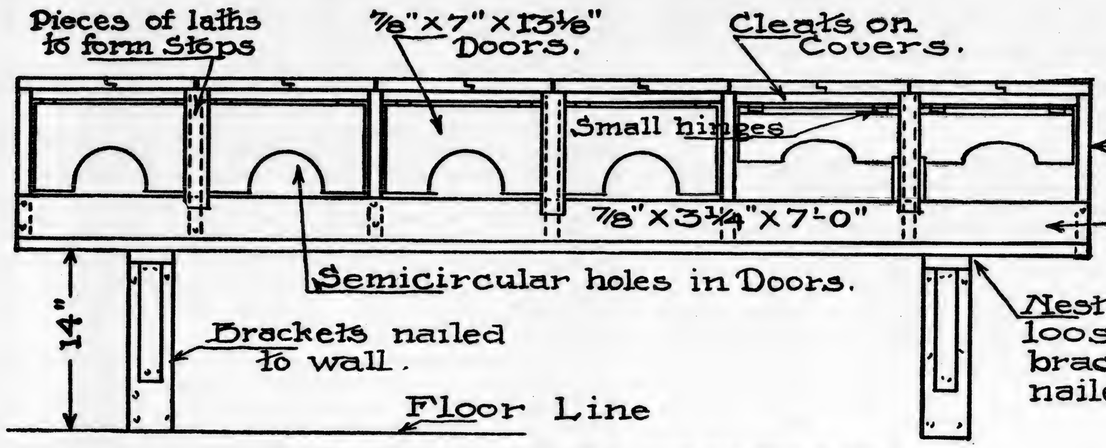
◦PLAN◦

◦Showing Two Covers removed◦



◦SECTION◦

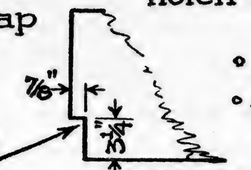
◦Showing Trap Door set◦



◦FRONT◦ELEVATION◦

◦Showing Two Trap Doors Set◦

◦DETAILS◦of◦TRAP◦NESTS◦

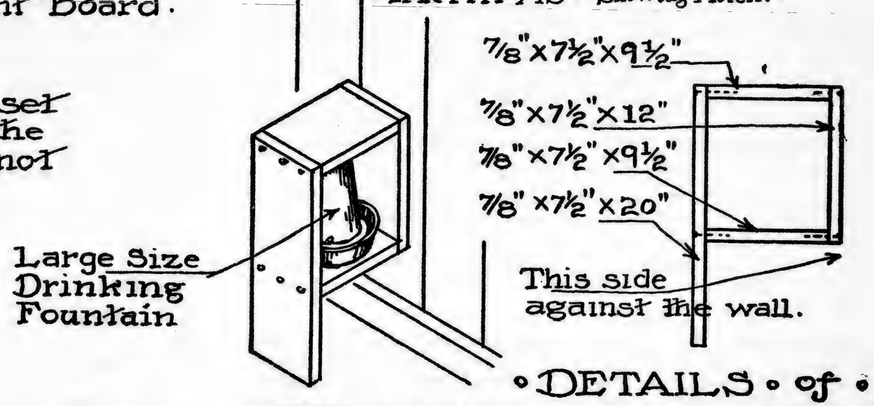


◦ENLARGED◦SKETCH◦

◦Showing hanging of Doors etc◦

◦FRONT◦END◦of◦

◦PARTITIONS◦Showing Notch.◦



◦DETAILS◦of◦

◦DRINKING◦FOUNTAIN◦

◦STAND◦

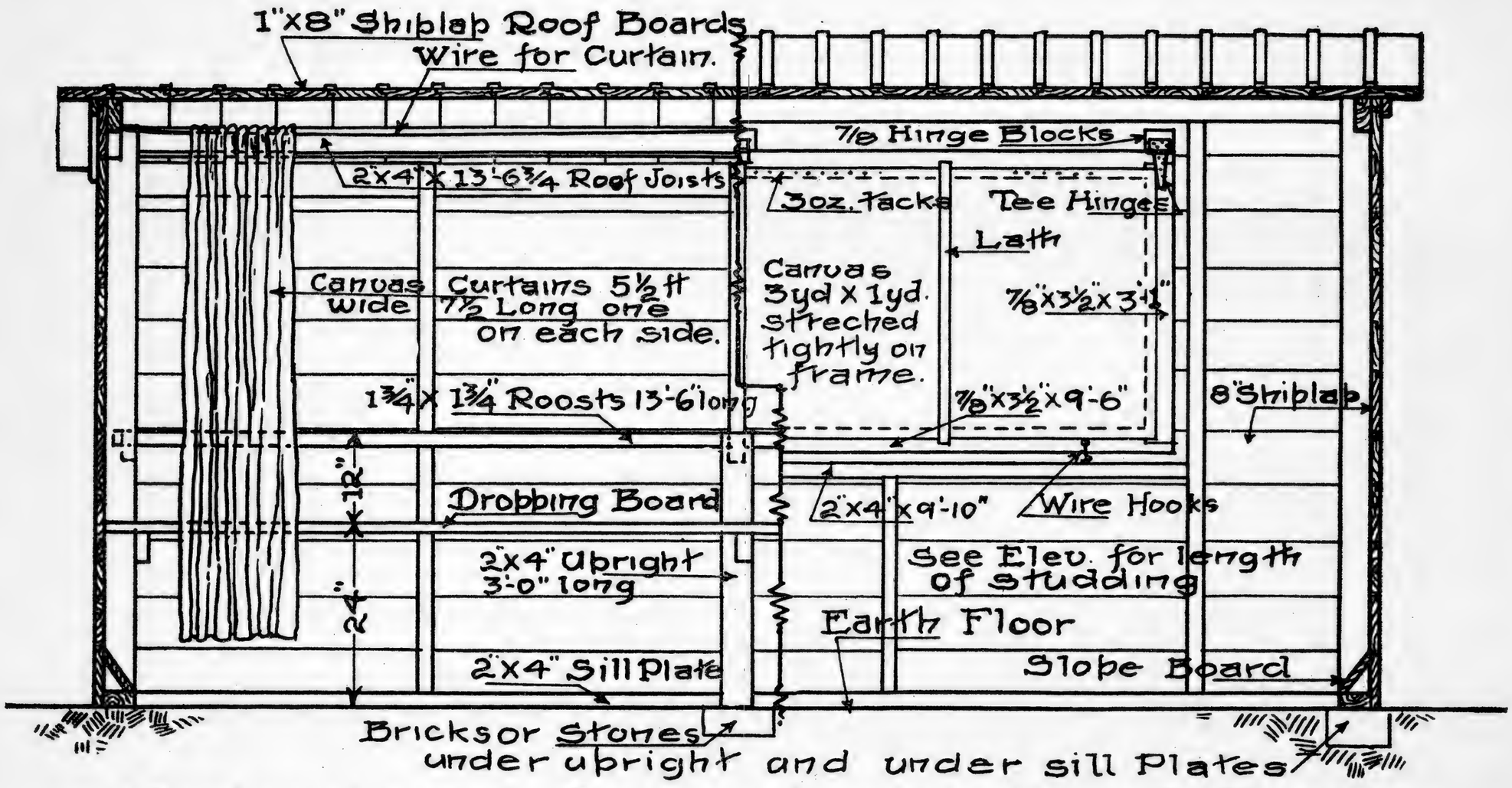
KELLERSTRASS PLAN OF

BREEDING AND LAYING HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0ft 1ft 2ft

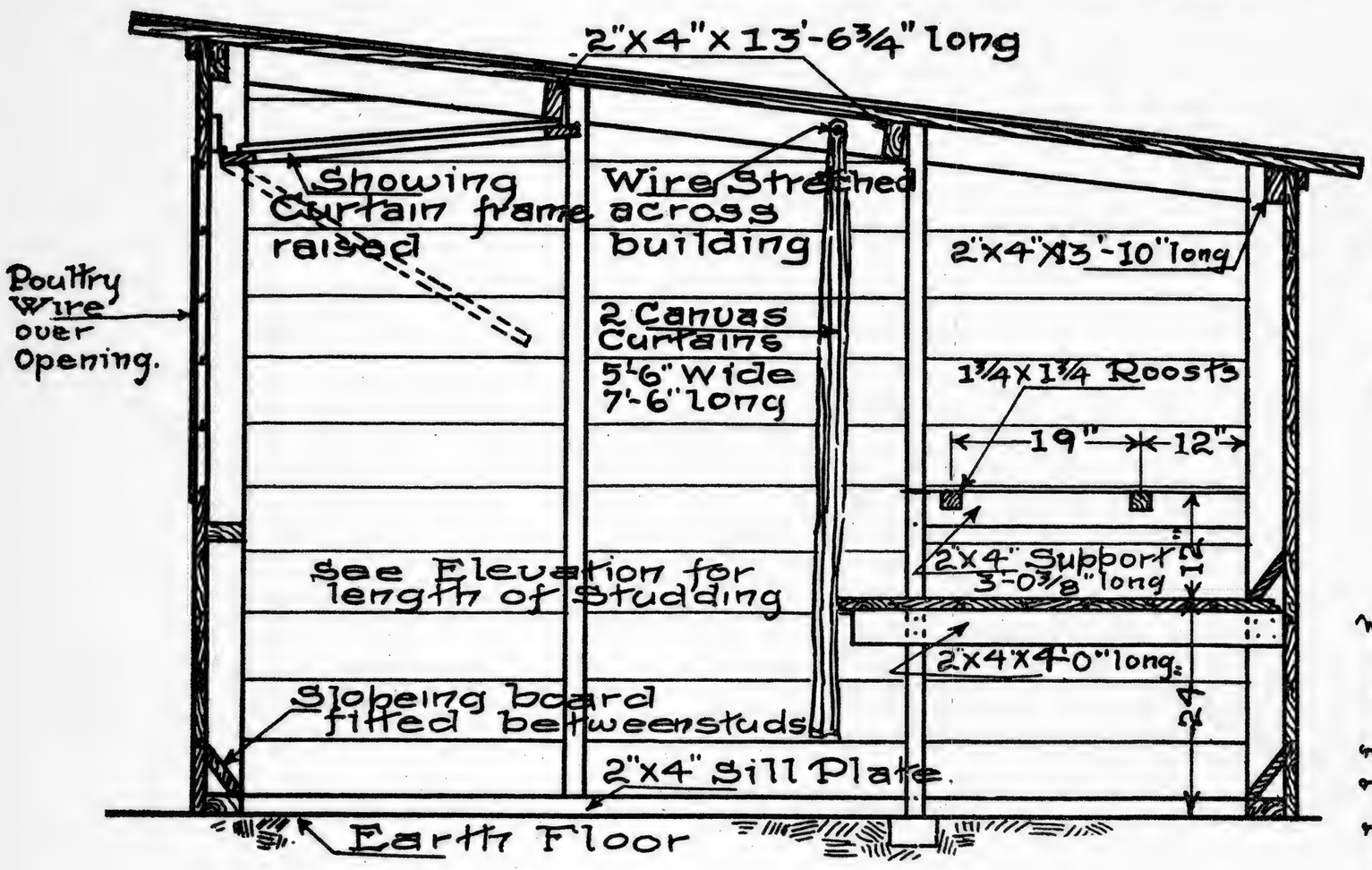
PLATE·V·



Looking toward Rear. Looking toward Front.

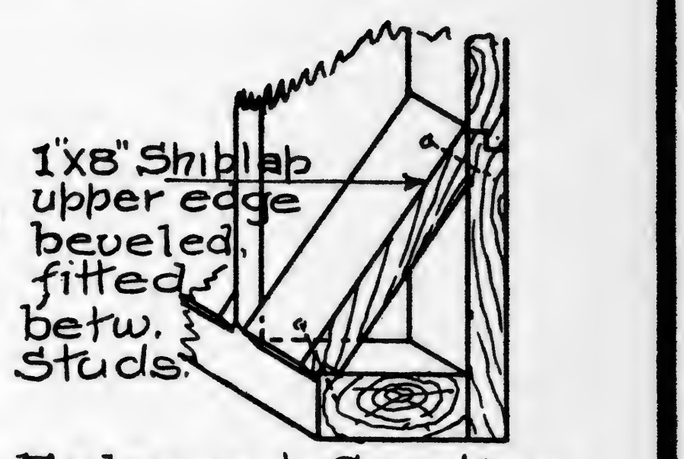
LONGITUDINAL SECTION

Taken on Line "A"A"

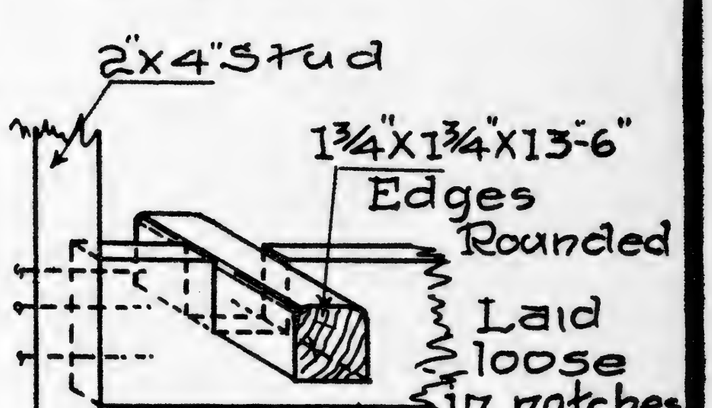


CROSS SECTION

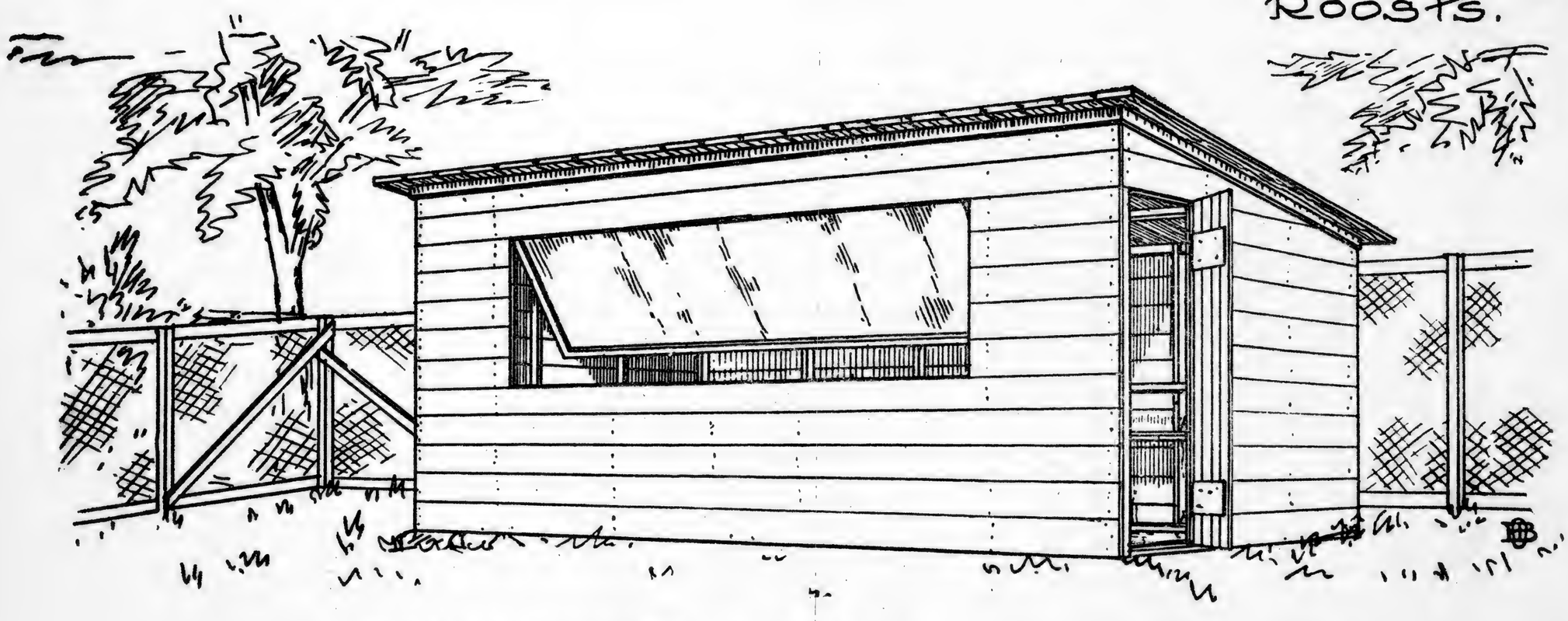
Taken on Line "B"B"



Enlarged Section Showing Slope Board.



Enlarged Section of Roosts.



THUMB SKETCH

of completed House

KELLERSTRASS PLAN OF

COLONY, BREEDING OR LAYING HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0 ft 1 ft 2 ft 3 ft

PLATE I

BILL OF MATERIALS.

2x4 Dimension:
103 sq. ft., 14 ft. lengths, 11 pieces.
48 sq. ft., 12 ft. lengths, 6 pieces.
27 sq. ft., 10 ft. lengths, 4 pieces.

168 sq. ft., total (board measure.)

1x8 in. Shiplap:
224 sq. ft., 14 ft. lengths, 24 pieces.
187 sq. ft., 12 ft. lengths, 27 pieces.
216 sq. ft., 10 ft. lengths, 28 pieces.

627 sq. ft., total.

1x4 in. Boards for frames, etc.:
14 sq. ft., 14 ft. lengths, 3 pieces.

1x6 in. Boards for strips:
14 sq. ft., 14 ft. lengths, 2 pieces.

⅜x1¼ in. Battens for roof:
24 pieces 12 ft. long. The lumber yard can rip these for you. or if you desire to do this yourself, get a 2x12 12 ft. long or two 2x6s 12 ft. long. A bunch of common laths may be used but makes a very poor job.

Canvas for frames and curtains:
13 yards, 36 in. wide, 8 oz. or lighter.

Hardware:
2 12 in. strap hinges and one hasp for door.
2 3½x5 in. tee hinges and 1 common 3½x3½ in. hinge and necessary screws for above.
3 wire hooks and eyelets, with an extra set of eyelets.
10 lb. 8 penny (d) nails for shiplap.
2½ lb. 10 penny nails for frames.
½ lb. 20 penny nails for frames.
¾ lb. 3 penny nails for battens.
1 oz. of 3 oz. tacks for canvas.
50 small staples for poultry wire.
15 ft. wire for curtain; common baling wire is all right.

Poultry wire or netting:
9½ lineal ft., 36 in. wide, 2 in. mesh.

Painting:
1¾ gal. of ready mixed white paint or enough white lead and oil to make that quantity.
¼ bu. of lime for whitewash.
1 qt. of creosote or crude carbolic acid.

HOW TO PROCEED WITH THE WORK.

Clear the ground selected for the house of weeds and rubbish and level up a space 15x11 ft., packing the earth and the outside 12 inches so as to get a good solid bearing for the sill plate.

Take two of the 14 ft. 2x4s and cut them down to 13 ft. 10 in. long and cut a notch in each end, as indicated on the Ground Plan on Plate II, and which are shown in the Detail entitled "Enlarged Corner of Sill Plate" on same Plate. This also shows how the back and front sill plate are nailed to the end plate. Get these end sill plates out of two of the 10 ft. 2x4s and in squaring up the ends cut them to 9 ft. 8 in. long. Lay these in their proper position and nail them together with 20d. nails as is shown on the Detail and on the Isometric Sketch above the Detail. Take care to get these plates level and square at the corners and they may be bedded on loose bricks or stones laid in the ground so as to have a solid base. Mark off on the plates the distances for the studding as is shown on the Ground Plan, making every mark exactly the distance that is shown on the plan.

Cut a piece of 14 ft. 2x4 into two lengths 6 ft. 8¼ in. for the front corner studs and a 12 ft. 2x4 into two pieces 5 ft. 6½ in. long for the rear corner studs. The corner studs are then to be bevelled on the top as shown on Plate III. Now take two more 14 ft. sticks and cut two lengths 6 ft. 11⅞ in. for the front studs and two lengths 6 ft. 7⅛ in. for the forward end studdings. Take two 12 ft. 2x4s, selecting a couple that are a fraction of an inch over 12 ft. long and cut a 6 ft. 2½ in. length off of each, making the two other end studs. Use the two pieces off of the end for the two rear studding which are 5 ft. 9⅝ in. long and cut the third rear stud out of a 10 ft. 2x4. These front, end and rear studs are to have 1⅝x3⅝ in. notches cut in the top as shown on the Detail on Plate III, to receive the sloping rafters and the front and rear horizontal rafters or cap plates. Cut two 14 ft. sticks down to 13 ft. 10 in. long for these cap plates and cut two more 14 footers down to 13 ft. 6¾ in. lengths for the inside horizontal rafters. Now take two 12 ft. 2x4s and cut into two lengths, 9 ft. 5⅜ in., for sloping rafters. The remaining two ends make 2 ft. 4 in. long for the short studs under the opening in front, per Plate II. The sloping rafters are to be beveled at each end at the same pitch or slope as the corner stud, as marked on Plate III. Be careful so that you do not get these bevels pitching toward each other, for they are to be parallel so that when the rafter is in place the beveled ends will both be perpendicular. See the dotted lines indicating the sloping rafter on the End Elevations, Plate III. Cut another 10 ft. 2x4 to a length of 9 ft. 10 in. for the horizontal piece at the bottom of the opening in the front, as shown in the Front Elevation, Plate II.

The 2x4 framing is all cut ready to nail together to form the frame of the house. Lay the 13 ft., 10 in. cap plates or front and rear horizontal rafters, whichever you wish to call them, one near the front sill plate and the other near the rear, and lay the front and rear studs, including the corner studs, in their respective places and nail them fast, using the 10 and 20 penny nails, nailing through the projecting parts of the notched stud into the cap plates, which are to set on edge when in position, and toe-nail into the corner studs which as they are now laying are on edge. Be careful to get the bevels on the corner studs sloping in the right direction and be sure the studs are exactly in the proper place before nailing solid so that they will be plumb when the wall is raised and so that there will be no extra work made by having to do some of it over. Now nail some diagonal braces on the inside of the frame, driving the nails so that their heads will project enough to allow of easy removal. Now raise the front framing and secure it in place with a couple of temporary braces and toe-nailing the studs to the sill plates, being sure the wall is plumb before securing solidly. Raise the rear framing next, toe-nailing the studs fast and place in position the sloping rafters, toe-nailing them securely to the corner studs and nail through the front and rear rafters into the ends of the sloping rafters. These being in position, place the end studding in position, setting them plumb and the correct distances apart, and toe-nailing to the sill plate and nailing to the sloping rafter in the same manner as the other studdings are nailed to the horizontal rafters. Now place the 9 ft. 10 in. piece between the two front studs, placing the short studs under in their places and nailing fast; then put up the inside horizontal rafters, placing them in the positions shown in the Cross Section, Plate I. Use the 10 and 20d. nails for securing the framing and use the steel square and level or plumb so that all will be straight and true and done in a workmanlike manner.

The frame is ready to receive the shiplap, so commence on the right end, working from the bottom up and nail on 11 pieces of the 10 ft shiplap, using 8d nails, until you have the piece "B" nailed on, and then take a saw and cut off the triangular piece projecting up above the sloping rafters and lay it to one side to be used on the left end. Now nail on 10 pieces of the 14 ft. shiplap on the back or rear and then the ten 7 ft. 5 in. long shiplap on the left end. Cut these out of 10 ft. lengths, the ten pieces off of the end to be made 2 ft. 5 in. long and used on the front. Now nail the 10 ft. piece "C" in place and saw it the same way as you did "B" and nail the triangular piece off of "B" in place and take the triangular piece off of "C" and nail it in place over "B" on the left end, thus wasting no material. The above Elevations are on Plate III. But now turn to Plate II and nail in place on

3/8"x1¼" Battens 11-6" long or Laths may be used

1"x8" Shiplap Roof Boards 11-6" long

2"x4"x13'-10" Long

⅞"x2½"x14-0" Long

1"x8" Shiplap 14-0" long

Hinge Blocks nailed to shiplap on inside.

Laths on inside of Canvas.

This opening is to have a 9'2"x3'-0" piece of Poultry Wire over.

36" Canvas 3yds long on curtain frame

9'-6"

1"x8" Shiplap 2'-5" Long

1"x8" Shiplap 2'-5" Long

2"x4"x6'-8¼" long

2"x4"x6'-11⅞" long

2"x4"x9'-10" Long

1"x8" Shiplap 14'-0" Long

2"x4"x2'-4" long

2"x4" Sill plate 13'-10" long

2"x4"x6'-11⅞"

2"x4"x6'-8¼"

° FRONT ° ELEVATION °

10 penny Nails

3oz. tacks

1½"

Top & Bottom 9'-6" long notched.

3½"

Sides 3'-1" Long

⅞"x3½"

Lath 3'-1" long

Canvas

ENLARGED CORNER of CURTAIN FRAME Showing Construction

20 penny spikes

2"x4"x13-10" Side Sill Plate

2"

Same

2"x4" Stud toenailed

3 5/8"

2"x4"x9'-8" End Sill Plate

ENLARGED CORNER of SILL PLATE

13'-10"

3'-6" 3'-5" B 3'-5" 3'-6"

2"x4" Roost Supports 3'-4" long

Block

Roosts 1¾x1¾x13'-6" long and laid loose in supports.

1"x8" Shiplap laid tightly. 13'-8" long notched around studding

3'-4"

2"x4"x4'-0" long Drop Board Supports

2"x4" Upright 3'-0" high

10'-0"

Dotted lines on this side indicates Roosts and Drob board.

Section Lines

A

2"x4" Studding. See Elevations for lengths.

Sills and Dropping Board to have sloped Board as shown on sections.

1"x3½"x6-2" Long.

2'-4"x5'-10" Door of 1x8" Shiplap

9'-6"x3'-4" Frame Covered with Canvas hung at top with Hinges

24" 9'-10" B 24"

° GROUND ° PLAN °

KELLERSTRASS PLAN OF

COLONY, BREEDING OR LAYING HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0 ft 1 ft 2 ft 3 ft

PLATE · II ·

the studding of the front the seven 14 ft. and the ten 2 ft. 5 in. pieces of shiplap, as shown on the Front Elevation, keeping the edges at the opening and on the outside corners square and even, so as to look presentable. This encloses the building except for the roof. Nail all the shiplap securely in place and see to it so that all the ends are square and all pieces of a length are really the same length, so that when the work is complete there will be no ugly see-sawing corner or edges.

Take twenty-five pieces of the 12 ft. shiplap and cut them 11 ft. 6 in. long as marked on the Drawings, or, if you wish, just cut enough off to make them all the same length, so that they will all have square edges or lay them on the roof just as they are, and nail them in place and then mark a line from one end to the other near the front and rear edges, using a straight piece of board or a chalk line to make this line straight, and saw off along this line. Be careful that you get the same projection of the eaves over the rear as you do over the front and also make the lines parallel with the front and rear of the building so that the boards will all have the same projection across the entire front or rear and not project more toward one end than they do on the other.

Now rip up your 12 ft. 2x12 in. plank or the two 2x6s, making twenty-four strips about ⅜ in. thick. If you have them ready made from the lumber yard or mill you will save that much labor. Place these strips one over each crack or joint in the roof and nail them securely in place with the 3d nails and the roof is ready for painting.

The lumber yards have in stock ready made battens that are ⅞x2 in. and which have molded "O. G." edges. They can be used in preference to the above strips if such is desired.

For the door cut four pieces 5 ft. 10 in. long out of two 12 ft. pieces of shiplap, for the battens use some waste pieces of shiplap or other lumber that is about 7 in. wide and 26 inches long and nail them solidly in place, driving the shiplap close together so as to make a good tight door. If the width exceeds 2 ft. 4 in. plane off enough so that it will be the proper width, as shown on Plate III. Take one of the 1x4 in. pieces and cut it into two lengths, one 6 ft. long and the other 6 ft. 2 in. long and trim the 6 ft. length to 3 in. wide and nail it on the corner stud forming the door jambs, as shown on the Left End Elevation on Plate III. Now nail the 6 ft. 2 in. piece on the inside of the projecting end of the shiplap, letting it extend ½ or ¾ in. beyond the end of the shiplap to form a rebate for the door, as is shown on the Ground Plan, Plate II, and is also indicated by the dotted lines on the Left Elevation. These lines also show the cross piece at the top which can be made of any strip of left-over lumber, fitting it between the jamb strip just put on and the stud, letting it extend down below the shiplap to form a rebate. Put the strap hinges on the door, placing them so that they come over the center of the battens and hang the door in position, and put on the hasp or latch as shown on the Elevation, Plate III.

The dropping board and roosts can be put in next. Take the 12 ft. 2x4 remaining and cut it up into three 4 ft. lengths for dropping board supports and take a 14 ft. 2x4 and cut two lengths 3 ft. 4 in. long, one 3 ft. ⅜ in. long, and one 3 ft. long, which is to be used for the upright to hold up center roost and dropping board supports. Take the 3 ft. 4 in. and 3 ft. ⅜ in. pieces and cut notches in them, as shown on Plate I both in the Cross Section and by the Enlarged Detail. These notches to be made large enough so that the roost will slip out and in. Before cutting up all the 14 ft. 2x4s it would be a good idea to pick out one that is as near full to the measurements as possible, that is, the thickest one in the pile, and reserve it for the roosts for which you can now rip it in two, planing off the rough sides and rounding the edges to about a quarter of an inch radius. Now nail the two side dropping board supports in place at the height shown on the Section, and also the side roost supports, being careful to get these level and the notches in the right position. Now cut a 1⅝x3⅝ in. notch in the 3 ft. piece, 12⅞ in. down from the top for the center dropping board support, as is shown on the Longitudinal Section and indicated on the Ground Plan, and then nail these in place as shown on the Drawings, being careful to get them on a line with the other supports at the sides. Place a brick or stone under the end of the upright to keep it from settling into the ground. Nail the 3 ft. ⅜ in. center roost support in place after the shiplap is in place for the dropping board.

Nail this shiplap in place, using the remaining 14 ft. stuff, cutting it to fit and notching around studdings, etc., as is shown on the Ground Plan, Plate II, and after this is in place, put the center support in place and lay the roosts in position, and this part of the work is done.

Take the two pieces of the 1x4 left and plane them down to 3½ in. wide and then cut a 9 ft. 6 in. length and a 3 ft. 1 in. length off of each for the canvas frame over the front opening. Notch the two 9 ft. 6 in. pieces as is shown by the Enlarged Detail on Plate II and nail the members together, the notched strips forming the top and bottom and the 3 ft. 1 in. pieces the ends, using 10d nails, and be sure it is all square before it is nailed solidly together. Cover this frame with three yards of canvas, tacking the tacks in about three inches apart. When stretching the canvas be careful not to bend the top and bottom rail or strips of the frame as they might have a tendency to do if too great a pressure is applied on them. After the canvas is on, nail in place the stiffeners of laths or other strips as is shown on the Drawings. These go on the same side as the canvas and applied over same. The frame is ready to be hung, so put on the hinges, one tee hinge at each end and the square hinge in the center, lift it in place, nail the hinge blocks in place, using short waste ends of lumber for these and fasten the hinges with the screws provided. Take care in putting the frame up so that it will be perfectly horizontal and put the hinges on perfectly true so they will not bind.

Saw up enough of the remaining shiplap or other 8 inch lumber to make the sloping boards as shown on the Section and Enlarged Detail on Plate I, fitting each piece carefully between the studs so as to make a tight job. The back edge ought to be beveled as shown to fit against the walls so as to leave no dirt catching ledge there.

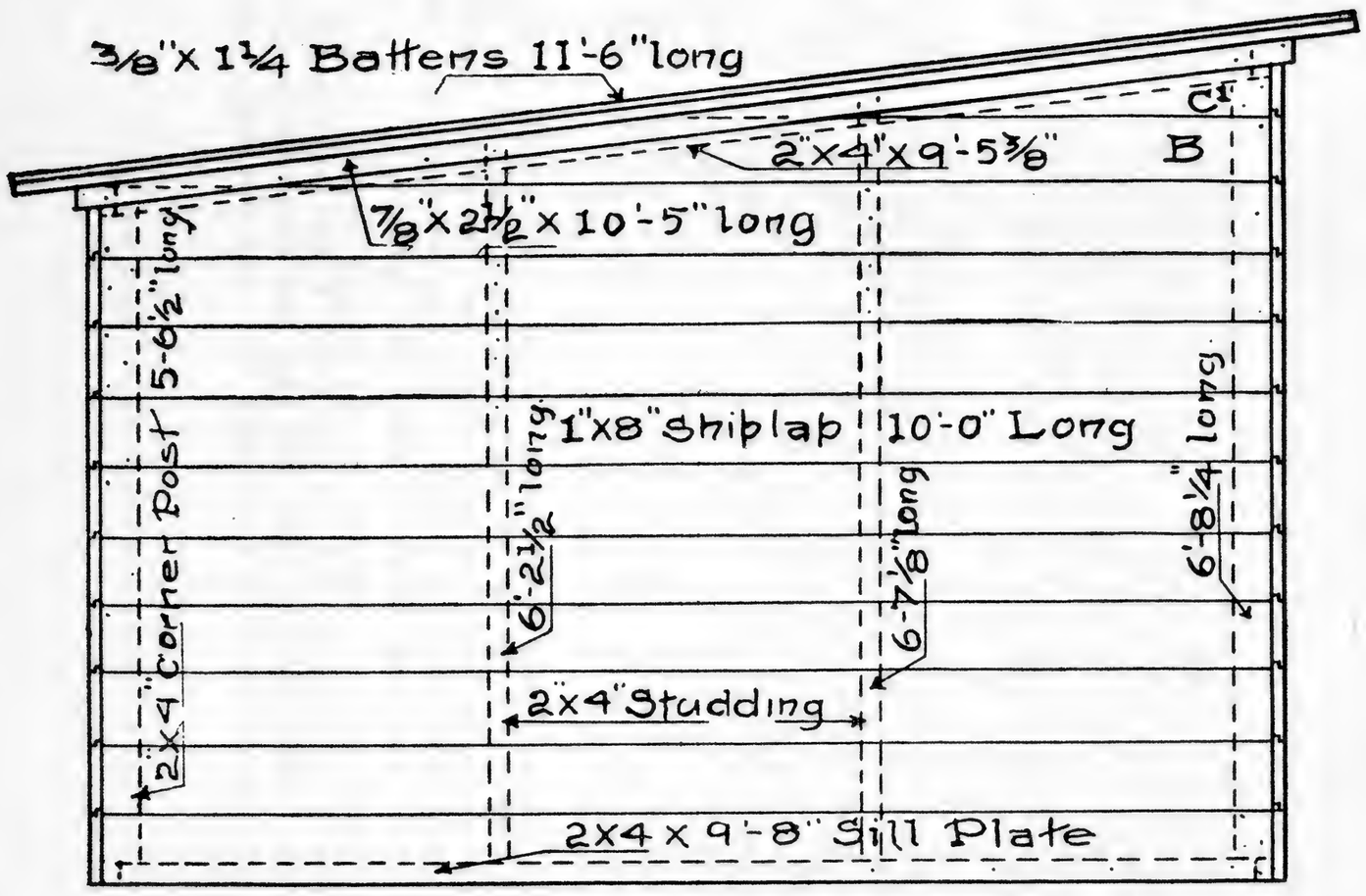
The strips under the eaves are not yet in place, so get them on. This can be done immediately after the roof boards are in place. Take the 6 in. boards and rip two 2½ in. wide strips 14 ft. long and two strips the same width but 10 ft. 5 in. long; bevel the top of the 14 ft. strips and nail them in place under the eaves along the front and rear, and then put the 10 ft. 5 in. strips up following the slope of the roof across the ends; mark the proper bevels on each end and take them down, saw them off along these marks and then nail in place. This gives a finish at the top of the wall and also serves to cover up the bad joint of the shiplap with the roof.

Have some one sew up the remaining canvas into two curtains 5½ ft. wide by 7 ft. long, making a fold or hem along the top edge for the hanging wire to pass through. Pass the wire through this fold in both the curtains and stretch the wire across from one side to the other in front of the roosts and dropping board as shown on the Section, Plate I. Shove one curtain to each side and you are ready to paint the house, or you can paint the house before the curtains are hung and so have them out of the way while this is being done.

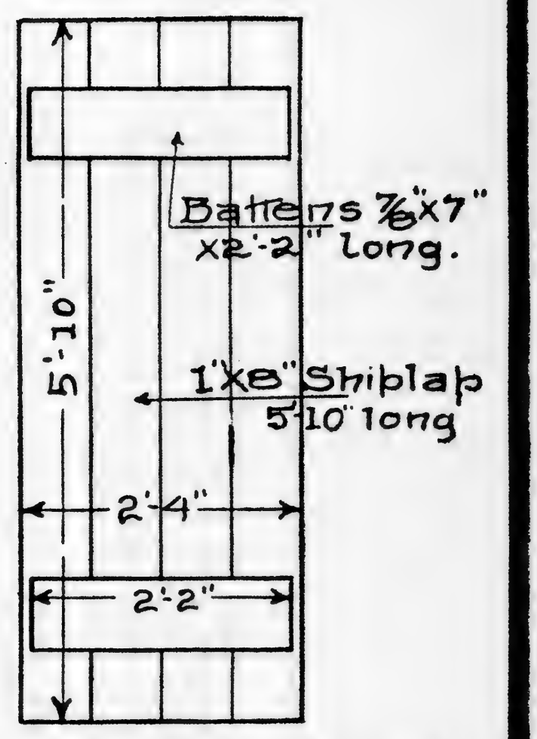
Paint the outside of the house, including the canvas frame, under side of the eaves and the roof, with white lead and oil or ready mixed white paint, brushing it out well, leaving no bubbles or lumps to peel off later. The roof at least should have two coats, so after the first or priming coat is thoroughly dry, say after five or six days, put on the second coat of the same color paint, spreading this on a little thicker than the priming coat. Any wood building ought to have two or three coats of paint and you can put these on at your leisure. Mix up some whitewash of fresh lime and water, making it about like thin cream and go over the inside, giving everything except the roosts and the top side of the dropping board, a thorough coat. Coat the roosts and the top of the dropping board with creosote or crude carbolic acid, saturating the wood thoroughly.

The house is now ready except for the poultry wire over the front opening which is to be put on with small staples four inches apart, and for the water fountain stand and nests which are described completely in the other Laying and Breeding Houses. You can use your own judgement in selecting the kind you desire for use in this house.

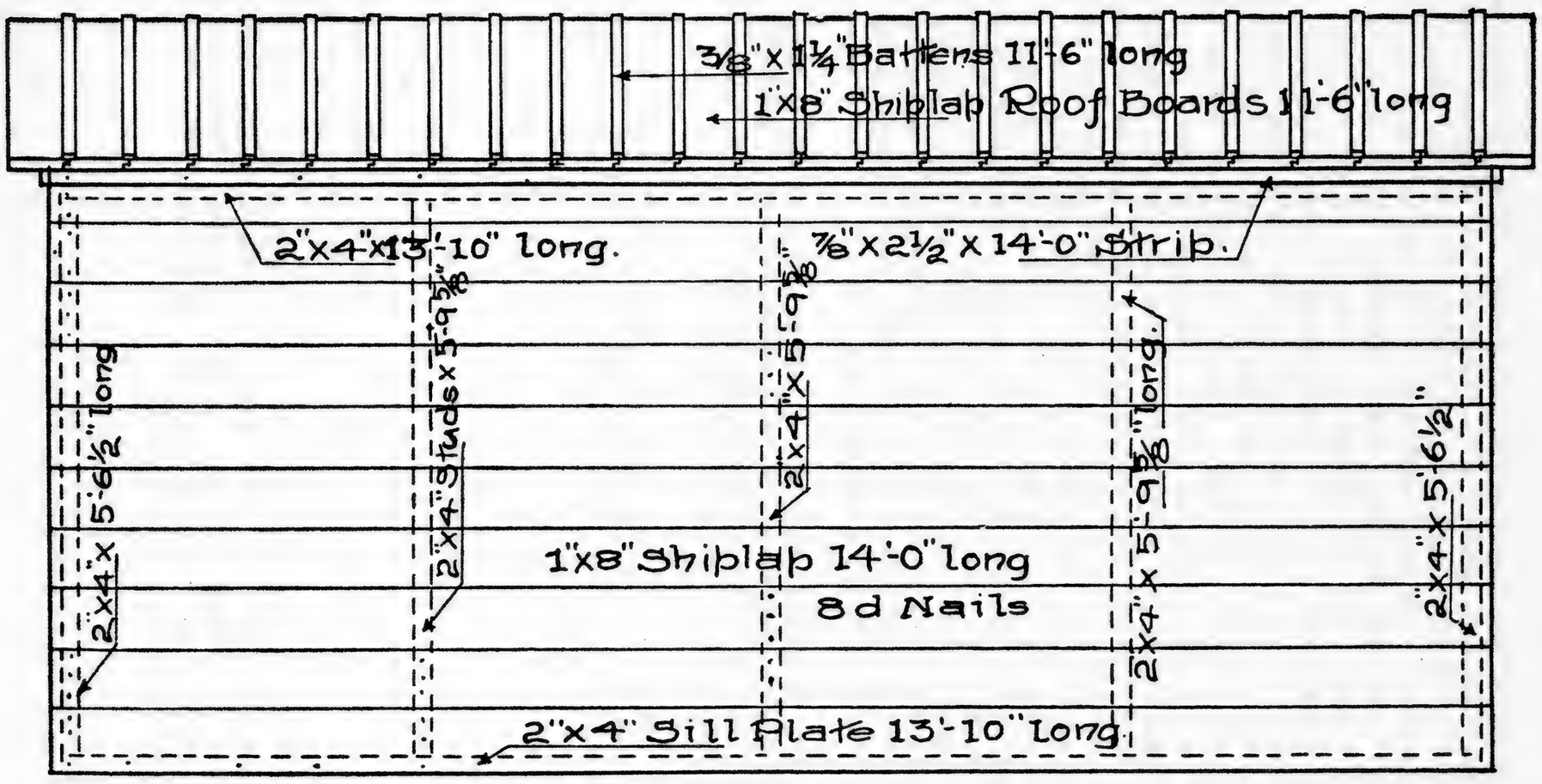
Build the fence as indicated on the Thumb Sketch around the plotted ground to be used as the yard or run, using 2 inch mesh poultry wire about 5 ft. high; whitewash the posts and gate and after this is all dry and the paint, etc., in the house is thoroughly dry, turn the poultry loose in their new home.



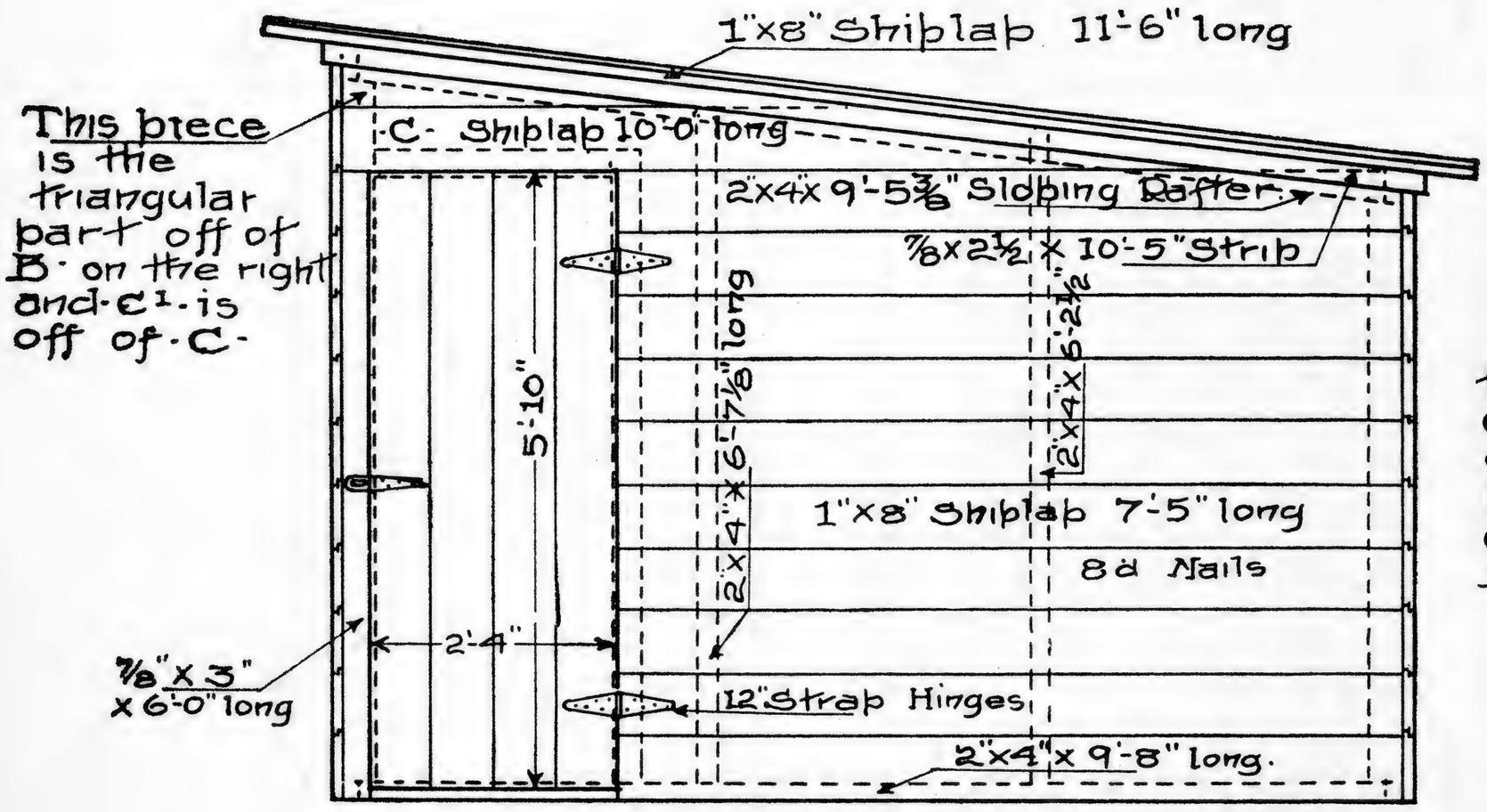
• RIGHT • END • ELEVATION •

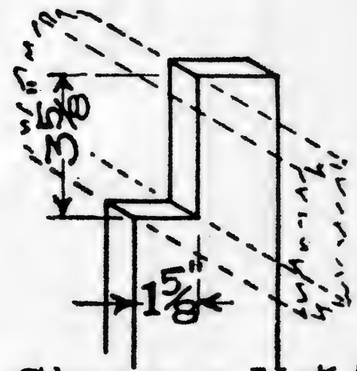


• INSIDE • ELEVAT'N •
• OF • DOOR •

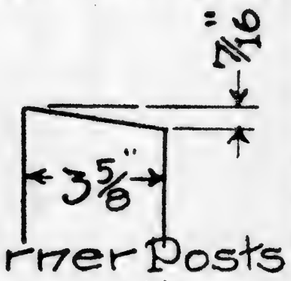


• REAR • ELEVATION •





Showing Notch to be cut in top of every stud except Corner posts, tops of which are shown below.



Corner Posts to have this bevel on top. Sloping Rafter same bevels

• LEFT • END • ELEVATION •

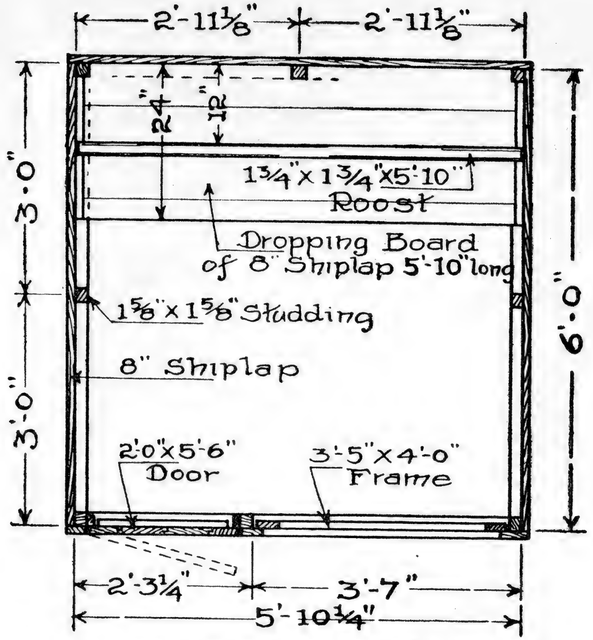
KELLERSTRASS PLAN OF

COLONY, BREEDING OR LAYING HOUSE

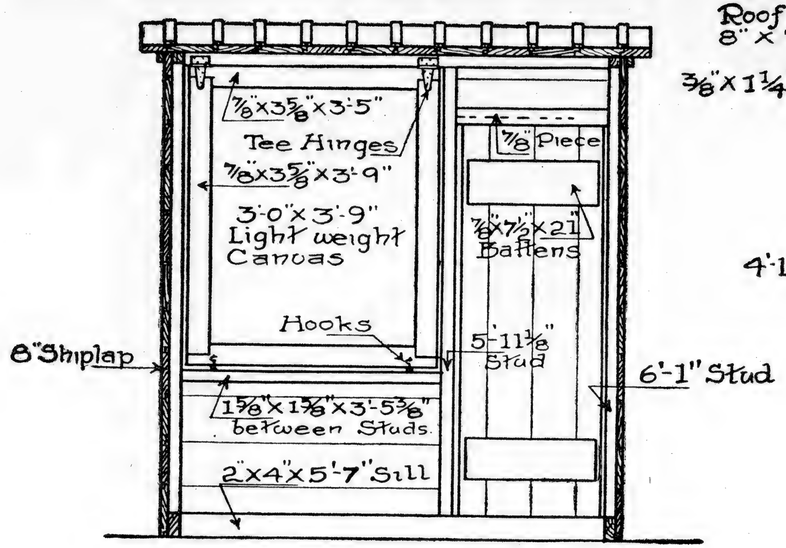
AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0 ft 1 ft 2 ft 3 ft

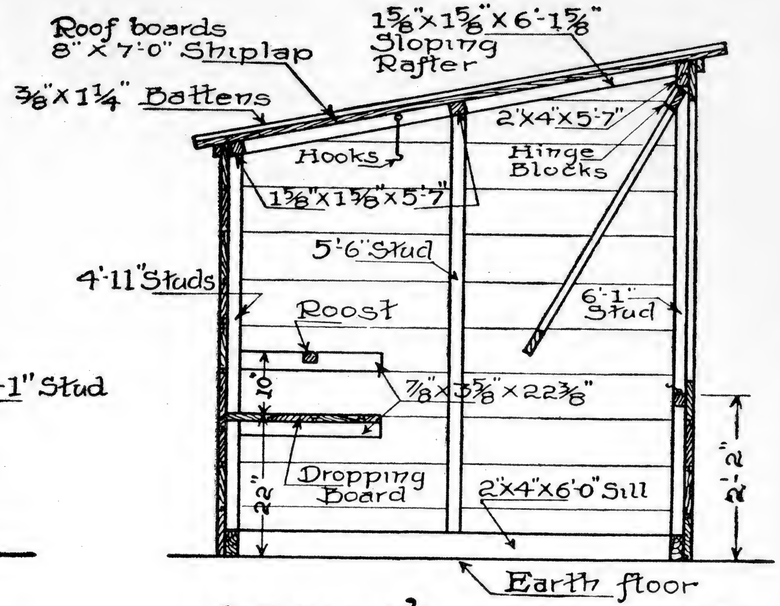
PLATE • III •



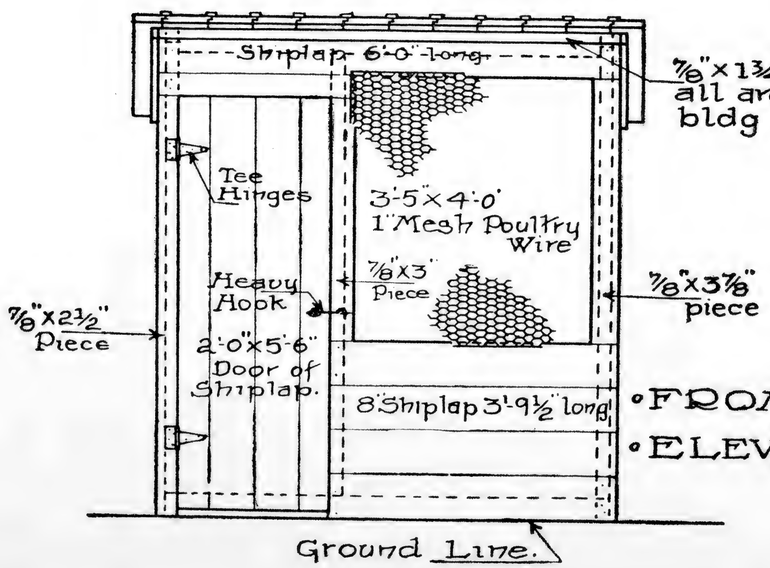
• GROUND • PLAN •



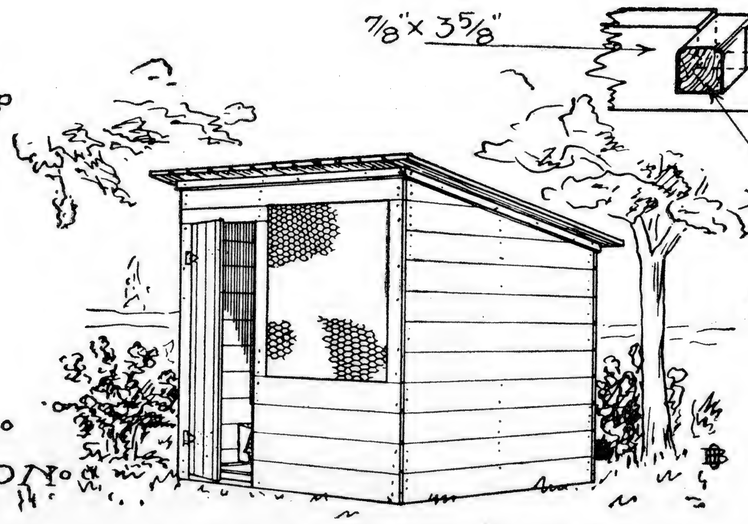
• CROSS • SECTION •
• Looking toward Front •



• LONG T'L • SECTION •



• FRONT •
• ELEVATION •



• THUMB • SKETCH •

• ENLARGED • DETAIL •
• OF • ROOST • SHOWING •
• SUPPORT •

KELLERSTRASS PLAN
OF
MOULTING & COLONY HOUSE
AS IT IS BUILT ON
THE KELLERSTRASS FARM
KANSAS CITY, MO.

Scale 12 6 0 1ft 2ft

PLATE • I •

MOULTING AND COLONY HOUSE

BILL OF MATERIALS.

2x4 Dimension for Studding, Plates, Rafters, etc.
48 sq. ft., 12 ft. lengths, 6 pieces, three of which are to be ripped into 2x2s,
1x8-inch Shiplap for Walls, Roof, etc.
56 sq. ft. 14 ft. lengths, 6 pieces.
168 sq. ft. 12 ft. lengths, 21 pieces.
224 sq. ft., total (Board Measure).
1x4-inch Boards for Frames, etc.
12 sq. ft. 12 ft. lengths, 3 pieces.
1⅜x1¼-inch Battens for roof.
6 pieces 14 ft. long. These may be gotten ready, sawed and dressed at the lumber yard or at a mill, but if you wish to rip them yourself, get an extra 14 ft. 2x4 for them.
Poultry Wire:
3½ lineal feet, 4 ft. wide, 1-in. mesh.
Light Weight Canvas:
4 lineal feet, 1 yd. wide, about 8 oz.
Hardware:
4 4½x3½-inch tee hinges and screws.
1 heavy hook or hasp.
2 small wire hooks and eyes.
2 long wire hooks with two eyelets for same.
4 lbs. 8-penny (d.) common anils for shiplap.
1 lb. 10-penny and a few 20 d. for frames.
1 box tacks for the canvas.
50 small staples for poultry wire.
Paint:
3 qts. White Paint for the exterior and some fresh Lime for Whitewashing the interior and a little Crude Carbolic Acid or Creosote for the roosts, etc.

HOW TO PROCEED WITH THE WORK.

Get a piece of ground ready that is about 6½x6½ ft. square by removing the grass and weeds and making it level, tamping it down around the edges so as to make a good, solid bearing for the sills.

Now take one of the 12 ft. 2x4s and cut it into two 6 ft. lengths and take one more of them and cut 2 pieces 5 ft. 7 in. long, sawing the ends off square. These pieces are for the sills and may be temporarily nailed together, leaving the heads of the nails projecting, so they can be easily withdrawn, the 6 ft. piece being on the outside as is indicated on the drawing and clearly shown on Plate II in the enlarged Detail, "Showing the Construction of the Corners of the Sills." While thus nailed together, lay it down in the place where it is eventually to set, square up the corners, using your steel square and level it up, using your mason's level so that the corners will all be right angles and will all be the same height, making the four sides all level, and bed them solidly on the ground.

Rip three of the 2x4s into two 1⅝x1⅝ in. strips each, plane off the rough sides and cut these up for studdings and rafters. Cut two of these six 1⅝x1⅝ in. strips into two 6 ft. 1 in, and two 5 ft. 6 in. pieces, getting one of each size out of each 12 ft. stick. These pieces to be used for side and front studs, per the Elevation on Plate II. Cut two more of these strips into three 4 ft. 11 in. and one 5 ft. 11⅛ in. lengths, to be used for the rear and the middle front studs, per the Sections and Elevations. All these studs are to be bevelled on top as shown on Plate II, except the 5 ft. 11⅛ in. long center front stud. Be careful so that you cut these bevels in the right direction if you have not sized the strips down to 1⅝ in. on both sides, for after ripping a 2x4 in. half, you will find one face will be 1¾ in. or over. This face is to be set so the shiplap of the walls will come in contact with it or in other words the studs are to set on the sills so that the side of the stud will be flush with the side of the sill so there will be no unnecessary projections inside of the inner edge of the sills. This means that the center, rear stud is to have the bevel run the 1⅝ in. way and the corner and side studs are to have the bevel run the wide way of the piece, which of course, will make the bevel a little longer than is shown in the Detail. Of course if the pieces are sized down to 1⅝x1⅝ in., this precaution is unnecessary, for it will not matter which side is turned in or out as both are the same.

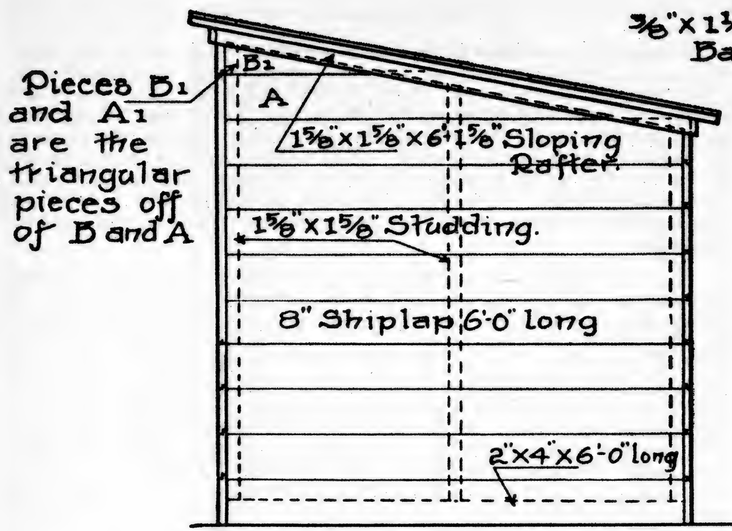
Take the two 1⅝x1⅝ in. pieces left and cut one 6 ft. 1⅝ in. length off of each piece for the sloping-rafters which are to be bevelled as shown on Plate II, and be careful about the bevelling as stated above so that the inner face of the rafters will be flush with the inner side of the studs. Cut one piece 3 ft. 5⅜ in. for under the opening in front as shown on the Sections and one piece 5 ft. 7 in. for a horizontal rafter out of the pieces left in cutting the sloping-rafters. Take the remaining 2x4 and saw a 5 ft. 7 in. length off of it to be used for the horizontal rafter in front as shown on the Section and take what is left and rip it in two, making one as close to 1⅝ in. as you can so the other part will be wide, which is to be cut to a length of 5 ft. 10 in. and laid aside for roost. The 1⅝ in. piece to be cut 5 ft. 7 in. long for the middle horizontal rafter.

All the framing is now cut and ready to be put together, so lift the sill frame out of place and draw out the nails and take it apart, being careful not to disturb the bearings or base you have made for the sills, so that that part of the work will not have to be done over again. Lay one of the side 6 ft. sills on the ground on its side and the corresponding sloping-rafter at the proper distance away from it. Lay the rear and front corner studs and the center side studs in their respective places and nail all fast, nailing through the sloping-rafter into the ends of the studs and toe-nailing the studs to the sill, using the 10 d. and 20 d. nails. Take care to keep the studs square with the sill, so that when the frame is raised the studs will be plumb and the rafter sloping right. A temporary brace may be nailed on to hold all secure. Keep the faces of the framing flush on both sides. Nail the other end up the same way.

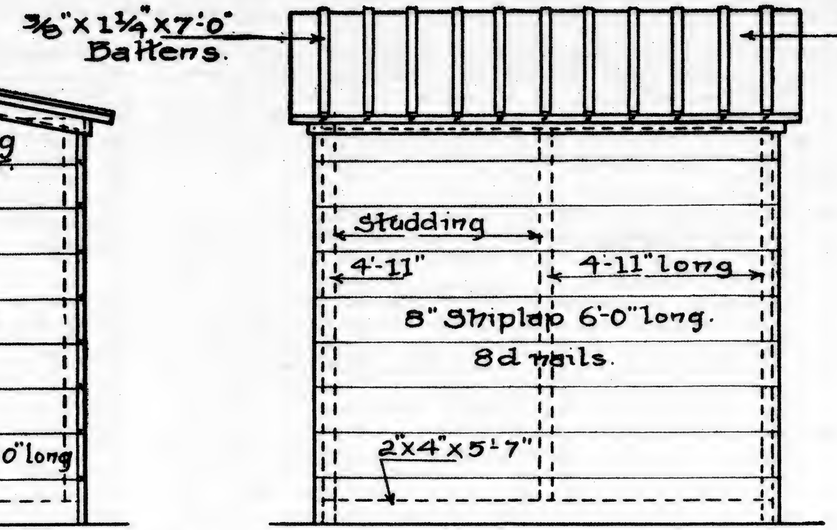
Now raise these end or side frames up in their proper places and nail the front and rear sills in place and the front and rear horizontal rafters, nailing through the sloping-rafters into the ends of the horizontal rafters and through the side sills into the ends of the 5 ft. 7 in. front and rear sills as shown by Detail of Construction at Corner on Plate II. Now place the rear and front center stud in place being sure that they are set according to the measurements on the Ground Plan, Plate I, and set plumb and parallel with the other studs. Nail them in place in the same way as the side studs by nailing through the horizontal rafter in back and toe-nailing to the front horizontal rafter and to the sills. Place the 3 ft. 5⅜ in. piece in position between the front studding, nailing through the studding. Put the middle horizontal rafter in place, nailing it securely and the frame is complete. It would be well to put on some diagonal braces to hold the studs plumb and the frame rigid while nailing on the shiplap.

Commencing with the left side per Plate II, nail on the shiplap with 8 d nails, commencing at the bottom and working upwards. Cut the ten 6 ft. lengths out of five pieces of the 12 ft. stuff, nail the piece "A" on the same as the other pieces and then saw it off with the slope of the roof, laying the triangular piece aside for use on the right side. Nail the nine 6 ft. pieces of shiplap on the rear next, and then the ten pieces on the right side, sawing the piece "B" off in the same way as was done with "A" and nail the triangular piece "A1" in place on the corner and take "B1" and secure it over "A" on the left side. Take a couple more pieces of 12 ft. shiplap and cut four pieces 3 ft. 9½ inches long out of them and nail them on the front as shown on the Front Elevation, Plate I, and then take the 6 ft. piece you have left from the rear and nail it at the top of the frame where shown. Keep all the ends of the shiplap square and be sure every piece is the same length so that there will be no jagged corners or edges, and so it can be said that the work is being done in a workmanlike manner.

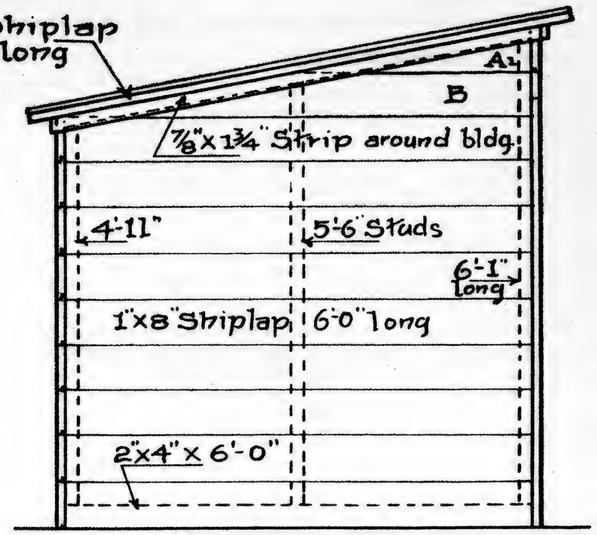
Cut the 14 ft. shiplap into 7 ft. lengths, making all the ends square and all the pieces the same length. Lay these boards on the roof, taking two of them for the outside and plane one rebate off of each, taking off the outside rebate



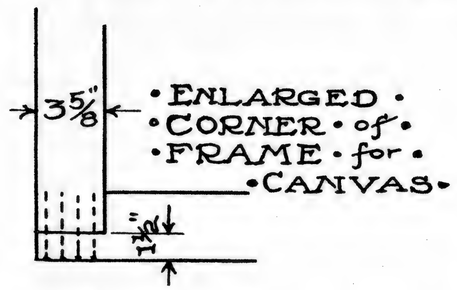
• LEFT • SIDE • ELEVATION •

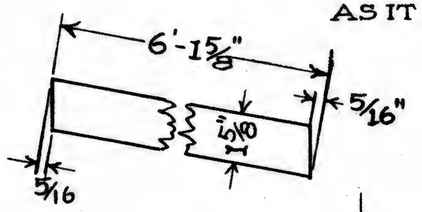


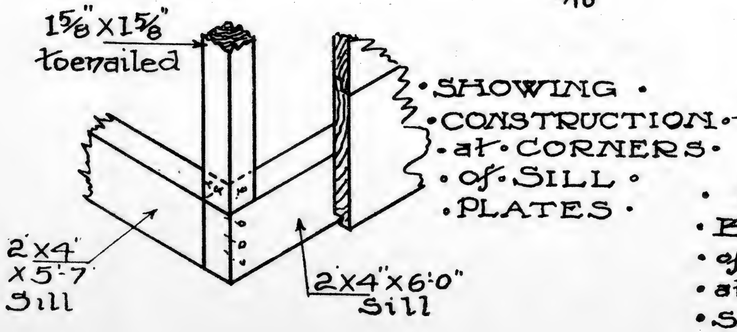
• REAR • ELEVATION •

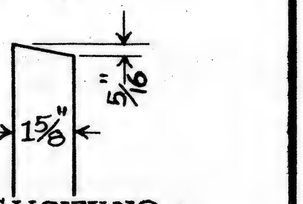


• RIGHT • SIDE • ELEVATION •









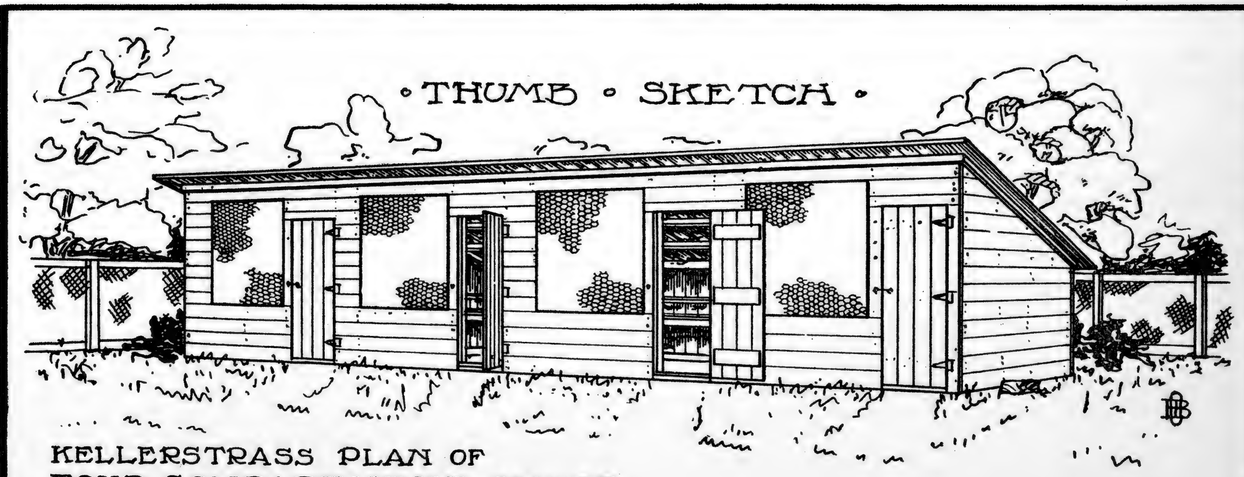
KELLERSTRASS PLAN OF

MOULTING & COLONY HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 12in 0ft 1ft

PLATE • II •



• THUMB • SKETCH •

KELLERSTRASS PLAN OF
FOUR COMPARTMENT HOUSE.
SEE PLATES FOLLOWING.

on each one as they will be laid on the roof, or in other words take off opposite rebates, and lay these, one at each side. Push these boards together as closely as they will finally be secured in place and move all of them until you have the same projection of the eaves on one side as you have on the other. Now nail one of the outside boards fast taking care to get the edge perfectly parallel with the side below and see that the projection of the eaves over the front will be the same as the projection over the rear. After the first board is securely nailed, nail the rest of them, keeping all the ends even and on a line, so that no board will extend further than the one beside it. Use 8d. nails for this, driving them in solidly.

Take the ⅜x1¼ in. battens and nail them in place over the joints of the shiplap, using the 3 d. nails and nailing them securely so that they will not buckle and warp away from the roof-boards. If you have not gotten these battens already ripped, take the 14 ft. 2x4 that you have provided instead and mark it off into six or seven equal widths which can easily be done by placing the end of a rule at one edge of the side of the 2x4 and letting it slant across the face until the 6 or 7 inch mark is at the other edge; on the diagonal thus formed, mark off at the inch marks on the rule, dividing the face into six or seven equal parts, and then extend these marks the entire length of the piece and rip or saw on these lines. Plane the rough sides off and nail these on in the same manner as described above for the battens.

Now put on the strips around the building under the eaves, fitting them tightly under the roof-boards. Pick out the longest 1x4 of the bunch and rip it into two pieces which makes a 1¾ or a 1⅞ in. wide strip. Measure these carefully and saw off in proper lengths as shown on the Elevation, bevelling off the top edge of the front and back strips and cutting a bevel on each end for the side strips which follow up the slope of the roof. You will find when cutting these lengths that there will be hardly enough, so cut another piece of lumber, being careful not to get something intended for another purpose, into enough 1¾ in. wide strip to make up the balance, which will not be over 1 ft. long.

The door can now be built so take two pieces of the remaining 12 ft. shiplap and cut into four 5 ft. 6 in. lengths. Take the pieces of shiplap left from cutting the front shiplap and cut two 1 ft. 9 in. lengths for battens. Plane the rebates off of these two pieces and then after having placed the other boards close together with their ends even and square, nail the battens on the back securely as shown on the Cross Section Plate I, being careful to have same placed so that in sizing the door down you can get a 2½ in. strip off of one side and still have plenty of room for nailing the outside boards onto the battens. The door as now nailed together is about 2 ft. 4½ in. wide, and 5 ft. 6 in. long, which is the proper length, but not width. Now rip off the 2½ in. wide strip off of the side arranged for it as above stated, first having removed the rebate which should be thought of when laying the battens in place on the back. Then measure off the 2 ft., the width of the door, and rip off the other side, allowing enough in width to permit of planing off the rough edges caused by the saw, without making the door under-sized.

On the front, measure up on the corner stud from the bottom of the sill the height of the door, adding 2 or 3 in., so that the door will be up that distance from the bottom of the sill or ground, as shown on the Front Elevation, Plate I. Now take a piece of the shiplap remaining from cutting the battens and cut a piece 2 ft. 5½ in. or a trifle over, in length, and fit it in place above this mark, ripping it off so that the bottom edge will be at the mark for the top of the door, as is shown on the Front Elevation. Now take the 2½ in. piece ripped off of the door and nail it over the ends of the side shiplap and over the corner stud as shown, making it fit close to the piece of shiplap across the top. Now take a piece of 1x4 in stuff and cut two lengths off of it for the vertical pieces at each side of the poultry wired opening, as shown on the Front, sizing or dressing these down to the sizes marked on the drawing, and fit them in place and nail them on solidly. This finishes the front as far as the covering is concerned, except for a 2 or 3 in. piece which may be nailed on the sill under the door extending under the end of the 2½ in. strip, making this surface flush with the other parts of the front. This piece can remain and be put on last if desired, using any of the remaining material or other boards that you may have.

Next the dropping board can be built. Take the remaining two pieces of 12 ft. shiplap and cut into 5 ft. 10 in. lengths for the dropping board and rip one of these to a proper width so that the pieces remaining, with the other three pieces of shiplap will make a combined width of 24 in. or 2 ft. as is marked on the Ground Plan, Plate I. Take the strip left and cut into two lengths 1 ft. 10⅜ in. for the dropping board supports or cleats, as is marked on the Longitudinal Section, Plate I, and nail these fast on the shiplap side at the proper height as shown, and lay the shiplap on these, notching the back piece around the studding as shown on the Ground Plan and nail them fast.

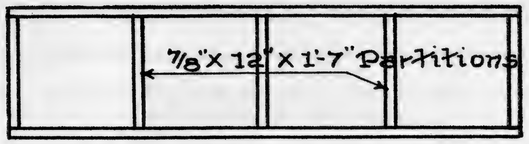
For the roost, use the 1⅝x1⅝ in. piece, laid aside for this purpose. Smooth up the rough side with a plane and round the corners. There are several small pieces of shiplap or other material lying unused yet, so pick out a couple of pieces large enough and long enough to make the supports as shown on Longitudinal Section, and cut the notches in them and nail fast at the proper heights. These pieces do not necessarily have to be the length marked on the drawings, except for the sake of appearances, but have to be long enough to allow of making the notch for the roost as is shown; so any short pieces large enough to allow for the cutting of the notch and large enough to nail without splitting, will do. Nail these fast to the wall at the right height and the right distance from the rear wall as marked on the drawings, and lay the roosts in place, and this part of the work is done.

Take the 5 ft. or nearly so piece of 1x4 left from cutting the pieces for the front and the remaining 12 ft. 1x4 and cut them into 2 lengths 3 ft. 5 in. and two pieces 3 ft. 9 in. long for the canvas frame, after having dressed or planed them down to 3⅝ in. wide. Notch the 3 ft. 5 in. pieces as shown on the Enlarged Corner of Frame on Plate II and nail the frame together, using 10 d. or other longer nails. Cover this with the canvas you have provided, stretching it taut, and placing the tacks about three inches apart.

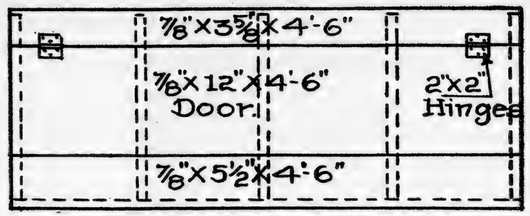
The canvas frame is now ready to be hung and the door is not hinged in its place yet, so put two of the hinges provided on the door and hang it in place, after having first put on the ⅞x1⅝ in. strips on the studs at each side of the door to form stops as shown on the Ground Plan and Section, and after having put in place the cross piece marked "⅞ in. piece" on the Section, to form a rebate or stop at the top of the door. These may be made of any ⅞ in. lumber, nailed securely in place, and see that they form a straight rebate for the door. Place one of the hinges over each batten on the outside of the door and be sure that the hinges are placed on true and solid, so they will not get wrenched off the first time the door is opened. Put in place the hasp and the door is ready. Nail a couple hinge blocks on the upper corners of the canvas frame, put the hinges on and secure them to the 2x4 running across the front as shown on the Sections, Plate I. Put the small hooks and eyes in their places as shown on the Section and the long ones in the ceiling as shown, to hold the frame up when it is open. That finishes the carpenter work so the house is ready for painting, although the 1 in. poultry wire over the opening in front, as shown on the Front Elevation, may be stretched in place, securing it with small staples about 4 in. apart, before this is done.

After the house, or the lumber in the house, is thoroughly dry, paint the exterior, including the roof, with a coat of the white paint you have provided, brushing it out well so that it will not blister and peel off. After the paint on the roof is thoroughly dry, give it a second coat. A second or even a third coat of paint may be put on to advantage on all parts of the house, but this can be done later whenever you have the time and inclination to do it. Mix the lime with water, making it about the consistency of thin cream and apply it on the inside of the building, forcing it into all the cracks and holes. The entire interior is to be whitewashed except the roost and the top of the dropping board, which are to receive a good coat of the creosote or crude carbolic acid mentioned in the Bill of Materials.

After this is all dry the house is ready for use.

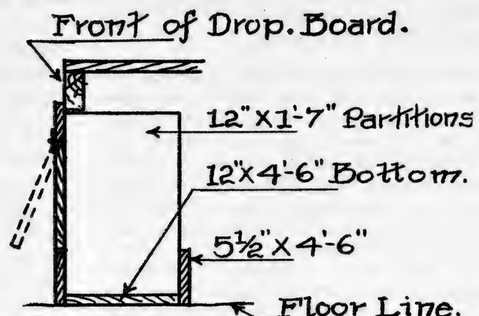


• PLAN •



• ELEVATION •

Nests are slipped loose under Dropping Board as shown, and not nailed in place.

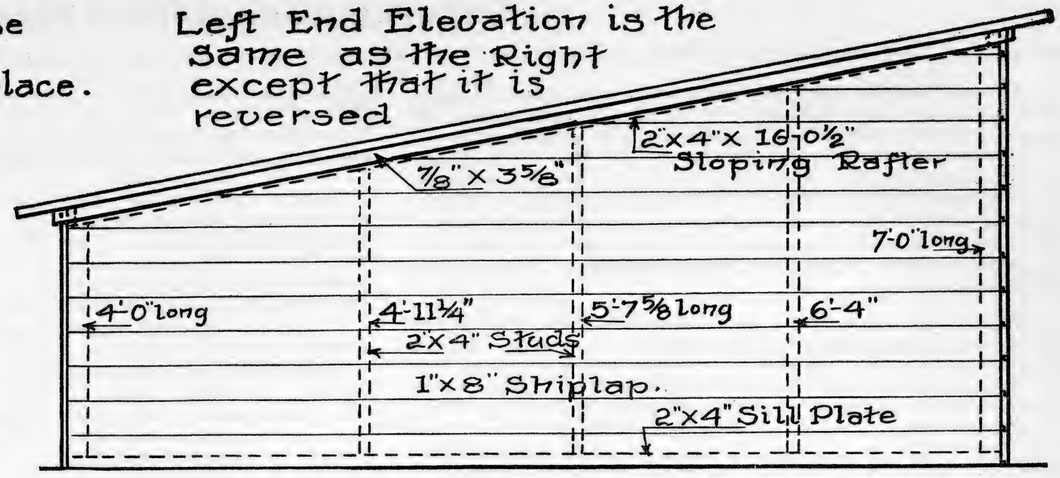


• SECTION •

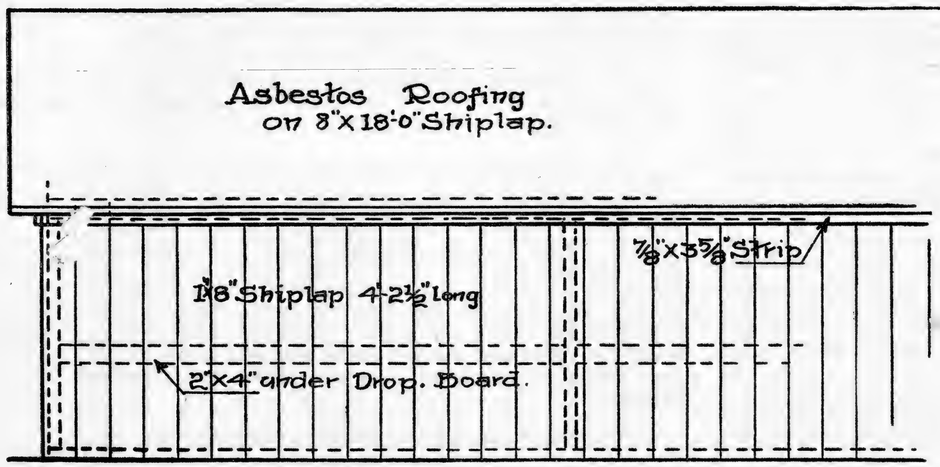
Scale 0ft 1ft

• DETAILS • of • NESTS •

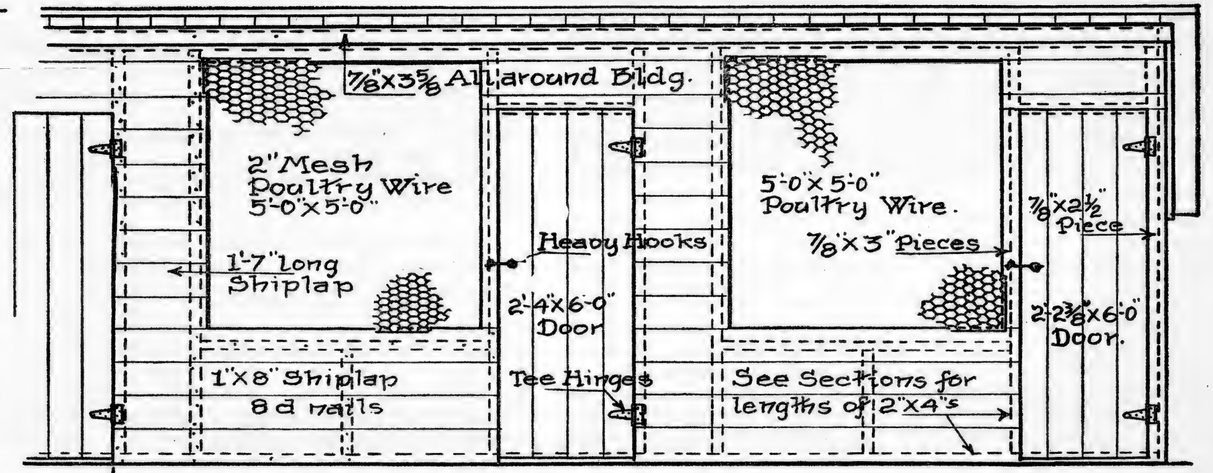
Left End Elevation is the Same as the Right except that it is reversed



• RIGHT • END • ELEVATION •
• Giving length of Studding •



• PART • REAR • ELEVATION •



Center Line.

• HALF • FRONT • ELEVATION •

• See floor plan for opposite halves. Details are typical. •

KELLERSTRASS PLAN OF

FOUR COMPARTMENT BREEDING & LAYING HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0ft 1ft 2ft 3ft

PLATE •I•

FOUR COMPARTMENT BREEDING AND LAYING HOUSE

BILL OF MATERIAL.

2x4 Dimension.
107 sq. ft., 16 ft. lengths, 10 pieces for sloping rafters, etc.
384 sq. ft., 18 ft. lengths, 32 pieces for plates, studs, etc.

491 sq. ft. Total (Board Measure.)

1x8 in. Shiplap.
1600 sq. ft., 18 ft. long.

1x4 in. Boards for Frames, etc., or this may be 1x8 ripped in two.
121 sq. ft., 14 ft. lengths, 26 pieces.

1x6 in. for Nests.
18 sq. ft., 18 ft. lengths, 2 pieces.

1x12 in. for Nests.
68 sq. ft., 2 pieces 18 ft. long and 2 pieces 16 ft. long.

1¾x1¾ for Roosts, or this may be 2x4s to rip in half. Get these as near full to dimensions as possible.
36 sq. ft., 18 ft. long, or 108 lineal ft. 2x2 in. stuff.

Roofing.
680 sq. ft. Asbestos or other good Ready Roofing.

Poultry Wire.
45 lineal ft., 5 ft. wide, 2 in. mesh, galvanized wire.

Canvas—Light weight, about 8 oz.
11 yards of 36 in. wide.
12 yards of 30 in. wide.

Hardware.
8 6x4 in. tee hinges for doors, 20 4½x3½ in. tee hinges for frames.
4 heavy hooks and staples for doors.
16 small wire hooks and eyes, 16 8 in. wire hooks and eyes.
8 2x2 in. hinges for nests and 4 knobs for same.
24 lbs. 8 penny (d) common nails for shiplap.
5 lbs. 10 penny and 2 lbs. 20d for framing.
1½ lbs. 20 penny finishing lairs for canvas and wire frames.
2 or 3 oz. tacks for canvas, 600 small staples for poultry wire.

Painting.
2 gal. of White Ready Mixed Paint or get 25 lbs. White Lead and 1¾ gal. pure Boiled Linseed Oil and a little Turpentine, if you desire to mix your own paint.
½ bushel Lime for Whitewash.
2 qts. Creosote or Crude Carbolic Acid.

HOW TO PROCEED WITH THE WORK.

The ground for this house will have to be about 37 ft. long by 17 ft. wide, allowing for the overhang of the roof, and should face south and be level and in a place where it is comparatively dry. If the ground is not level, take some of the earth off of the high side and shovel it over on the low side, tamping all the loose dirt so as to make it solid, and especially around the outside, where the sill plates are to lie; it should be tamped solidly so as to give them a good bearing and not have a tendency to settle with the first rain. On the high side of the leveled ground, dig a trench leading to each side or end, depending on the way the ground slopes, to carry the water coming from the highest ground above, to each side so it will not run all over the floor of the poultry house, when it rains heavily. This is a precaution that will not be necessary in a dry climate, or if the house is set on the top of a hill, or on practically level ground.

After the ground is leveled and tamped and prepared for the building, select four good solid 18 ft. 2x4s out of the dimension pile of lumber, and two 16 ft. long 2x4s, for which pick out two of the shortest in the pile, for the longer ones will be needed for the rafters. It would be well when ordering the 16 ft. stuff to mention that you would like five pieces extra long stuff, at least ½ inch long, if they can be gotten. Take the two 16 ft. 2x4s and cut them to a length of 15 ft. 8 in. and square up the ends. Square up the ends of the four 18 ft. 2x4s, making them exactly 18 ft. long, and then notch them in one end, making the notch 1⅝ in. deep and 3⅝ in. broad, to take the end of the 16 ft. 2x4s. The Detail entitled "Corner of Frames for Canvas" on Plate III, shows the size of the notch which will be the same for these sill plates as for the canvas frames, although the nails are not the same, being 20d common for the sill plates. Take another one of the 18 ft. 2x4s and cut 4 feet off of it, which cut into two pieces 2 ft. long, for splices, to be nailed on the under side of the plates at the joint in the center of the 18 footers that are to be used for front and back sill plates.

Now lay the 15 ft. 8 in. sill plates one at each end and the notched 18 footers across the front and rear, with the notches at the outer ends, as indicated on the Ground Plan, Plate II, so as to fit over the end of the end sill plates, and lay the splices at the center, at the joints. Lay the plates out straight, using a line to straighten them out by, and a steel square to square the corners up by, and nail them together, using the 10d and 20d nails, being careful not to jar them too much out of line, or out of square. Nail through the edge of the notched 18 footers into the end of the end sill plates and placing the splice on the under side, nail through the plate into same. The sill plate is now nailed up and ready to be leveled up and probably squared up a little. Use your mason's level and be not afraid that you set it down too many times on the plate. Keep it there until you get the plate absolutely level, so that the building will not be sway-backed or have a hump in it. Level up all the corners, using brick bats or pieces of rock to raise same or scrape away some of the earth to lower it, and level up the sides and ends in the same way. The sill plate is to lay on top of the ground as far as it is practical to get a solid bearing, only the splices in the center going under the surface. To prove that the corners are square, measure along one plate 8 ft. back from the corner and measure 6 ft. off on the other from the corner and then measure the diagonal from the 8 ft. point to the 6 ft. point, and if the corner is perfectly square and true, the diagonal will measure exactly 10 ft.

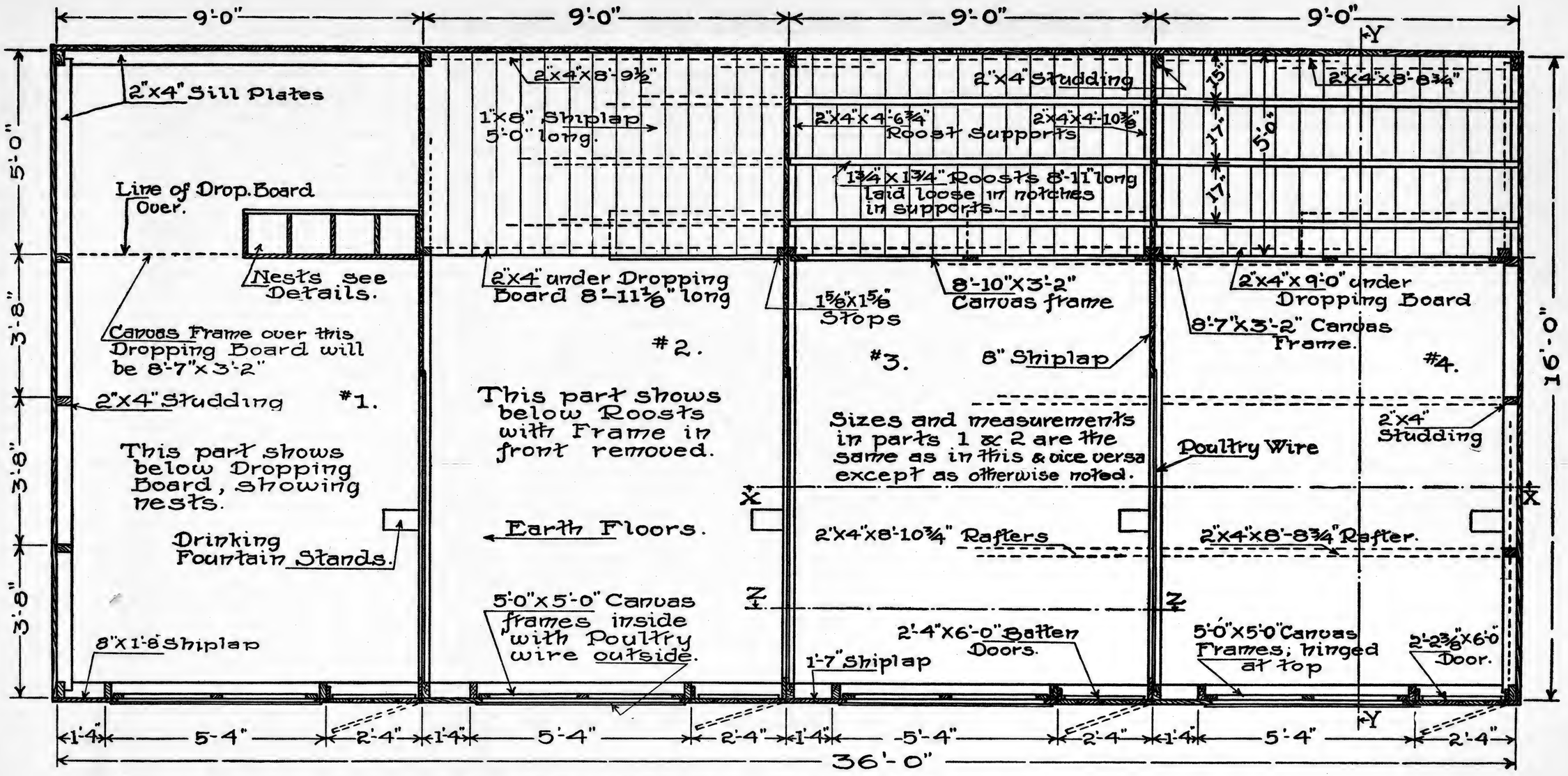
The outside size of the sill plate as it now lies on the ground, will be as marked on the Ground Plan, 36x16 ft., and when you are satisfied that it is square and level, mark off the measurements for all the studs and partitions as marked on the Ground Plan, Plate II.

Take three more of the shorter 16 ft. 2x4s and saw them off to a length of 15 ft. 4¾ in. for the 2x4 at the bottom of the cross partitions, as indicated on the Ground Plan and shown on the Sections on Plate III. Place these at the 9 ft. marks on the sill plates, being sure that they are set on the same side of the marks as shown on the Ground Plan, viz.: The east side, if the building faces south, and before nailing see that they are all parallel with each other and with the end sills. These partition 2x4s set on edge as shown. Toe-nail them to the sill plates, front and rear, being careful that everything is kept square and in line.

The sills are now all laid ready for the studding, so take the 14 ft. piece of 2x4 left from cutting the splices, and 6 full 18 ft. 2x4s and cut two 7 ft. studs out of the 14 ft. piece and eleven 7 ft. studs out of the 18 footers. These to be used for the front studs and take the five 4 ft. pieces left from this sawing or cutting and use for the rear studding, and cut the 11 ft. piece remaining into two 4 ft. 11¼ in. lengths for the shorter end studding. Take two more 18 ft. 2x4s and cut one 6 ft. 4 in. and one 5 ft. 7⅝ in. length off of each. These are also for the end studs. Five of the 7 ft. front studs and the five rear studdings are to be beveled on top as shown on the Detail on Plate III, and all of the end studs of which there are 6, are to be beveled as shown on the same Plate, but by a different Detail. The remaining eight front studs to have square tops. Take one of the 6 ft. pieces left from cutting the end studding and saw it off to a length of 5 ft. ¾ in. and take another 18 ft. 2x4 and cut into three lengths 5 ft. ¾ in., which are to be used for the horizontal 2x4s under the front openings, per the Section on Line Z-Z, on Plate III, and take the other 6 ft. piece and cut it into three pieces 1 ft. 10¼ in. and take another of the 18 ft. 2x4s and saw two more 1 ft. 10¼ in. lengths off of it, for use under the horizontal 2x4s, as shown on the same Section. Take the same piece and cut two 2 ft. 4 in. lengths and one 2 ft. ⅜ in. length out of it, and take the 3 ft. piece that is lying around and cut another piece 2 ft. 4 in. long. These four pieces to be used above the door as shown in the Section on Line Z-Z. That is all the studding, etc., for the walls and they are ready to be nailed together.

Next get out the sloping-rafters for which use the long 16 ft. 2x4s and bevel one end and if it is long enough cut the other bevel on the other end, as is shown on Plate III by the Enlarged Detail, showing the bevels on same. If these pieces are not 16 ft. 11-16 in., as the Drawings call for, but are over 16 ft., as you have most likely ordered them, lay your bevel on the 16 ft. mark and mark it off, even if it does not cut off more than half of the width of the piece. Saw it off on this line which will give plenty of room for nailing, etc. There will be five of these rafters. In case any of them should be too short to cut as above described, make the sides of the rafters 15 ft. 11½ in. long instead of the 16 ft. as marked, and nail a ½ in. thick block on the end, thus bringing it to the 16 ft. length on both sides, and it might be that this is the better method if all of them are much shorter than 16 ft. ½ in. Take four 18 ft. 2x4s and square up the ends that are to butt, making each length exactly 18 ft. long. These four pieces are to be used for cap plates or front and rear horizontal rafters, whichever you may please to call them. On the Section they are entitled "2x4 Full Length of Building."

Lay two of these 18 footers along the front sill plate, distribute the front studding along the front, laying the 5 ft. studs with beveled ends at the ends and at the 9 ft. marks and toe-nail them fast to the cap plate, being careful to have all the studs in the proper places and on the right side of the mark, and then nail solidly, using 10d nails. Put in the horizontal piece or 2x4 under the large openings and nail fast, pailing through the studs into the end of it, and set it according to the measurements given on the Section on Line Y-Y, on Plate III, and then nail the other horizontal pieces above the doors in place, letting them come 5 ft. 11 in. from the bottom of the studs. Be sure and set these pieces horizontally and square with the studding and be sure that the studs are square with the plate and horizontal rafters. Now nail a piece of shiplap or other lumber diagonally across the studs for a temporary brace to hold the studs in position. About three of these braces should be nailed across the front



• GROUND • PLAN •

N
W E
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KELLERSTRASS PLAN OF
FOUR COMPARTMENT BREEDING & LAYING HOUSE
AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0 ft 1 ft 2 ft 3 ft.

PLATE · II ·

walls and put them on the inside of the studs so that they can remain in position until the shiplap is all on. Do not drive the nails clear in, but leave them projecting enough so that the claw of the hammer can get a hold of the head so that the braces can easily be removed without having to pound the piece of lumber used all to pieces in taking it down.

Take the other two pieces of 18 ft. 2x4s that have been squared up and lay them near the rear sill plate and distribute the five rear studs, placing them at the 9 ft. marks as shown on the Ground Plan, and toe-nail these fast to the cap plate or rear horizontal rafter and toe-nail the two sections of cap plate together at the joint and put on a temporary splice, if necessary, which may also be done on the front wall. This splice to be put on the outside and should not cover more than half the 2x4, so as to give a chance to nail through the plate into the end of the sloping rafters, when the same are placed in position. Take the same care in driving the nails for this splice as for the braces, as stated in the preceding paragraph. When the studs are all nailed solidly to the cap plate and are square with it so that they will be plumb when the wall is raised into position, nail a couple braces, one from each corner stud up to the plate, to hold them securely so that they will not get out of square. The inside studs in the rear are so few that they can do without further bracing.

Get sufficient help so that the front wall can be raised without any trouble and raise it, securing it in place by toe-nailing the studs fast to the sill plate and putting up two or three braces from the studs down to the cross and end plates, to hold same up while raising the rear wall. Before nailing the front studding solidly in place be sure that they are set plumb and square and are in their right places and then toe-nail them securely. Now raise the rear wall, which only consists of the cap plate and the five studs, and hold it up, toe-nailing the corner studs lightly in their places. Then put up the end sloping rafters and nailing through the cap plates, both in front and rear, secure them solidly in place, then put up the center sloping rafter and the one on each side of the center and nail securely. Now after seeing that the rear studs are all plumb and square, toe-nail them solidly to the sill plate and also toe-nail through the rafters into the ends of the front and rear studs that come under same, as shown by the Drawings, making all secure. Put up the end studding next and place them according to the measurements on the end sill plate, which are as per the Ground Plan on Plate II, and plumb them up and toe-nail them fast. Put in the short vertical pieces under the horizontal 2x4 under the front opening, nailing through same into the ends of the uprights and toe-nail the uprights fast to the sill plate. Use the 10d and 20d nails for putting up this frame.

The horizontal rafters can be put in next. Take six 18 ft. 2x4s and cut three 8 ft. 8¾ in. lengths and 9 lengths 8 ft. 10¾ in. long, which now put up between the sloping rafters in their proper places, as shown on the Ground Plan and on the Section taken on line Y-Y, and nail securely, either by toe-nailing or driving the nails through the sloping rafters, whichever you find is the most practical for you. The frame is now all ready to be covered with shiplap. If need be put up some more braces to hold the frame rigid while the shiplap is being nailed on.

Starting with one of the ends nail on the shiplap, commencing at the bottom and laying upwards and use the 8d nails, driving them all in solidly. Saw the 18 ft. shiplap off to 16 ft. lengths, keeping all the ends perfectly square, and before nailing fast the boards that will have to be cut on the diagonal on account of the slope of the roof, put them up in place, mark the slope of the roof and then take them down and saw them on the diagonal line, and keep the pieces left for use on the other end. Board or shiplap up the other end in the same manner, using these boards that have already been cut on the diagonal for the part under the roof. Use your good judgment in placing them so that there will be the least possible waste. The 2 ft. pieces off the ends of these boards can be used in boarding up the front.

Nail the shiplap on the rear next; same is to run vertical as shown on the Part Rear Elevation on Plate I. Cut the shiplap to 4 ft. 2½ in. lengths and nail it in place, being careful that the joints are kept perfectly vertical.

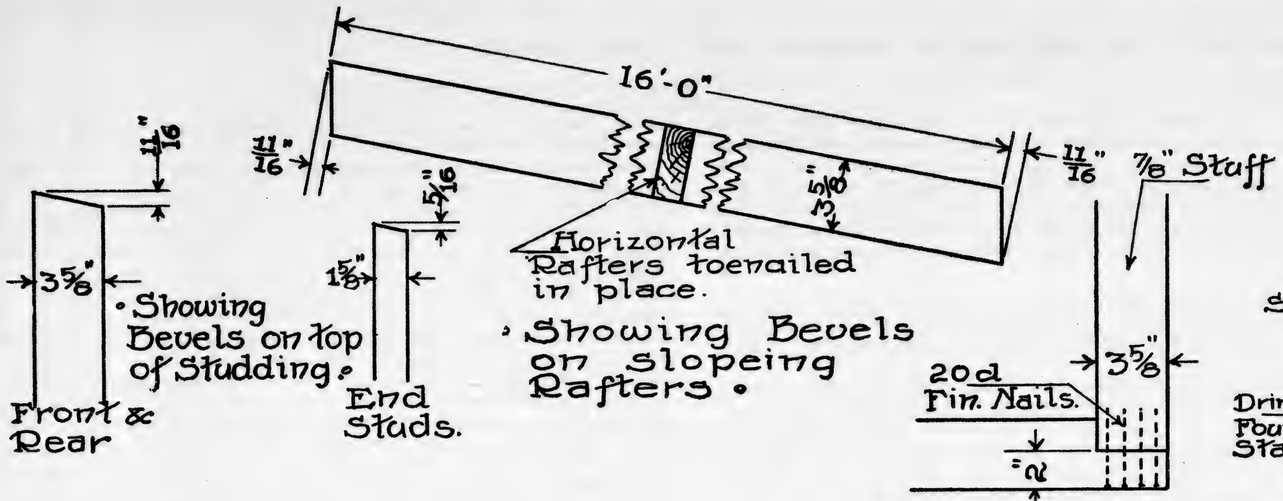
Now board up or shiplap the front, per Part Front Elevation, Plate I, using the scrap pieces left from the ends and rear wherever they will work in properly, getting the other pieces out of the 18 ft. stuff, being careful to use all the pieces possible, so as not to have any waste material. Follow the Drawings accurately and keep all the ends of the shiplap square and all the edges straight up and down, so that there will be no place where one board projects beyond or recedes from the line of the one next to it, making a good workmanlike job, and nail all the boards well, being careful not to split those that are short. Let the ends of the boards that project into the opening in front, project at least one inch beyond the studding. Take care in sawing the boards which are notched over the doors, so that they will leave about a 5/8 in. rebate, or in other words, will let the 2x4 cross piece at the top of the door openings, project down about 5/8 in. from the bottom edge of the shiplap, as indicated by the dotted lines on the Front Elevation, Plate I. The vertical strips at the sides of the doors to be made of any material that is not used and may be ripped out of shiplap or you can wait with putting these on until the doors are ready to be hung. These strips are to line up with the edges of the shiplap as shown on the Elevation.

The cross partitions can be boarded up next so as to give stiffness to the sloping rafters so same will not sag or be springy, when the roof is put on. Nail the shiplap on vertically as shown in the Section taken on Line Y-Y, letting it run clear to the roof as is shown for a part of the way and in front of that, letting it be 2 ft. 1½ in. high as marked, with an open space above for poultry wire. Put the pieces that go clear to the roof up and mark them, then take them down, saw them off and nail in place, or if you so desire, get one partition all cut and then use those pieces of shiplap for a pattern for the other two partitions. Be sure and get these nailed on the side of the studs shown on the Drawings to make all the measurements given work out correctly, and be sure and set the first piece plumb so that all the joints will be vertical. Take three pieces of the 1x4 in. stuff and cut to about 8 ft. 4 in. long, as marked and nail in place as shown and then nail the short pieces of shiplap to it and to the 2x4 at the base. The shiplap is to run clear to the outside line of the studs both in back and in front, and in front the piece that comes next to the wall is to run clear to the roof or ceiling. This piece also forms the rebate for the door on that side so that it will have to come flush with the outside edge of the studs, as shown on the Ground Plan.

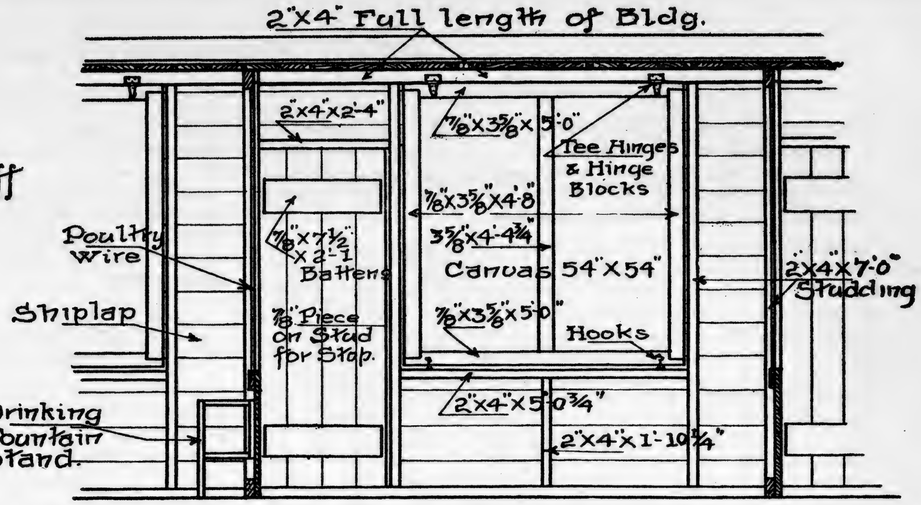
Get the roof under cover next so that if it should rain the work that is done will not get a wetting. Take of the 18 ft. shiplap sufficient to cover the roof and lay it in place, starting at one side or rather end with a board off of which remove the outside rebate or the projecting tongue which forms the rebate, and let it project over the edge as far as it is possible, leaving enough to get a good hold for nailing, and see that it projects the same distance over the front as over the rear so as to make the projection of the eaves the same. Nail a board on the other end in the same manner, but nail this only temporarily for it might be handy to move it a fraction of an inch or so to make it fit tightly with the board that will come next to it. Put a nail in the ends of the two boards, stretch a cord or chalk line across, to which lay the remaining boards, keeping them at least nearly straight, if not entirely so, but try to keep them as straight as you can. Lay the shiplap tight and nail securely, shifting the boards slightly if necessary to make them come out properly with the board on the end. If necessary rip one of the boards to fit in the space left, but if the gap is not too great, shift the board or boards before they are nailed solidly, enough to fill the gap in the roof. Now shift the chalk line from the edge to the top of the board, fasten it at each end so that it will be parallel with the wall below and in back of all irregularities on the edge, and have it taut. Then chalk it and lift it in the center and let it drop, slapping the boards, thus making a white chalk line across the whole front, or if this is not a success, mark along the line with a pencil or scratch with a nail and then saw off along this line or mark. Do the same at the rear edge and saw the ends off there also, making both edges straight.

The roofing can now be applied. Follow the directions of the manufacturers and it will insure you a good roof. The ready roofing, asbestos or other good brands of ready roofing, of which there are several on the market, comes in rolls with the necessary roofing nails and roofing cement rolled up with it, in quantities enough to lay that roll. Start laying the roofing at the back or the lowest point in the roof, laying one width of roofing the entire length of the building or house; turn it over the rear edge and nail it fast there, and at the upper edge, if so stated in the directions. Turn it over the edges at the ends and also nail fast there. Lay the next strip or width of roofing, giving it the lap over the roofing already laid, that the manufacturers say it should have, and nail and cement it fast, all according to their directions. Continue in this way with all the widths or strips of roofing until the roof is entirely covered, turning it over the edges at the ends and nailing and cementing it fast, all according to directions. The top strip of roofing is to be turned over the front edge and is to project down below the roof boards about an inch to form a drip for the water so that it will not run down the under side of the roof boards. If the manufacturers' directions say that the roofing you have put on should have a coat of paint, provide same and apply it as directed, for this will give life to your roofing, but do this only if the directions call for it. This paint is not included in the Bill of Materials. The building is now under a water-tight roof.

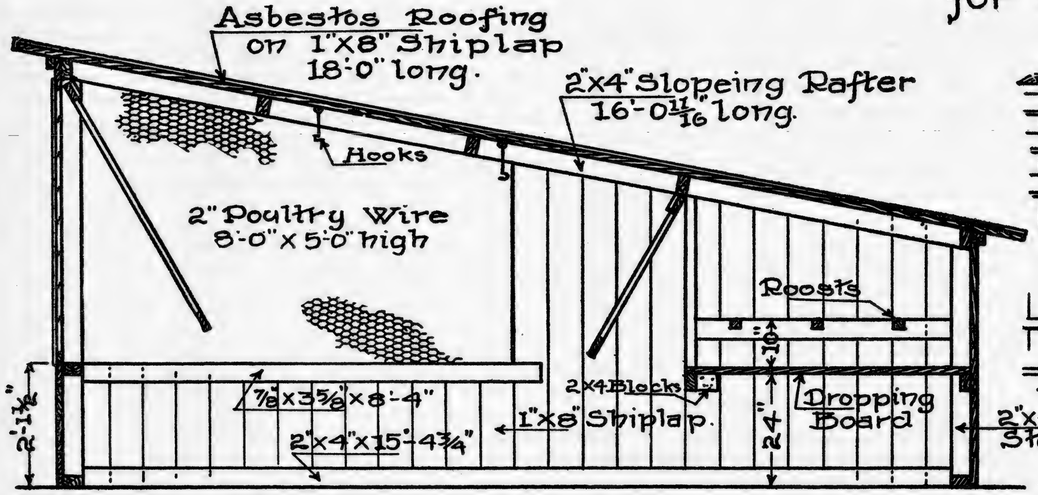
Now nail in place the strips under the eaves around the building. Take eight of the 14 ft. 1x4 in. boards for this which makes about 112 lineal feet. 36 ft. 2 in. of this is to be beveled on the top edge for under the front eaves and 36 ft. 2 in. more to be beveled for under the rear eaves. Nail these pieces up, fitting them tightly to the roof boards and keep the ends flush with the shiplap at the ends. Now put up a strip on the end following up the slope of the roof, mark the bevel on the ends and saw it off and nail in position. Then take another piece and butt it with the first piece to continue the end strip, for the first piece will not go across the whole end. Mark the bevel on this last piece, saw it off and then nail it in place, finishing the end. Treat the other end the same and the strips are up, serving as a bed-mold under the eaves.



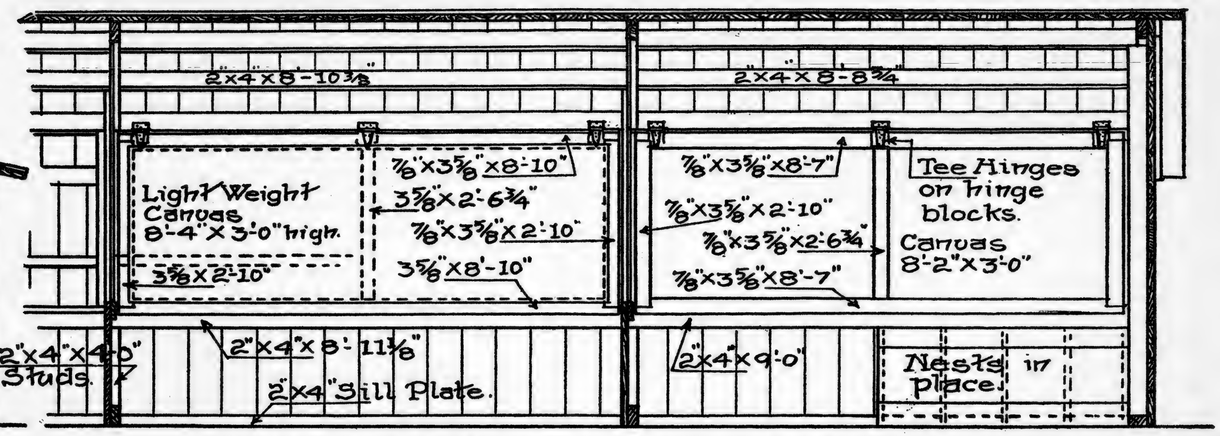
• Corner of Frames for Canvas •



• SECTION • on • line • Z • Z •
• Looking toward Front •



• SECTION • on • line • Y • Y •
• Showing Canvas Frames swung back •



• SECTION • on • line • X • X •
• Looking toward Rear •

KELLERSTRASS PLAN OF
FOUR COMPARTMENT BREEDING & LAYING HOUSE
AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0ft 1ft 2ft 3ft

PLATE · III ·

The dropping boards can now be built, so take four 18 ft. 2x4s and cut one length 8 ft. 8¾ in., one 9 ft., three 8 ft 9½ in., and three 8 ft. 11⅛ in. lengths out of them for dropping board supports. Take the 8 ft. 9½ in. pieces and the 8 ft. 8¾ in. piece and nail them on the rear wall, as shown on the Ground Plan, Plate II, and on the Section on line Y-Y, Plate III, going outside and nailing through each piece of vertical shiplap on the wall to help keep the shiplap from buckling as well as to hold the 2x4s up. Get these pieces the right height from the plate and keep them level Pick up eight blocks off the ends of the 2x4s and nail them on the cross partitions, as shown on the Section on line Y-Y, to form a nailing block on which to nail the ends of the 8 ft. 11⅛ in. pieces and the 9 ft. piece that form the front supports for the dropping boards. Get these all level and the proper distance from the rear wall and the same height as the 2x4 across the rear, which distance should be as marked on the Section, and nail fast with 10d nails. Nail on the shiplap as shown on the Drawings, in 5 ft. lengths, using 8d nails and placing it as close as possible to make the joints as narrow as they can be made.

The roosts are to be gotten out of the three extra 18 ft., full to measurement 2x4s, you have provided or the 108 lineal ft. of 2x2 in. stuff. If you provided the 2x4s rip them through the middle and then cut the six pieces thus formed into two 8 ft. 11 in. lengths each, making 12 roosts. Plane the rough sides of these off and round the edges to about a quarter of an inch radius. Cut the supports for the roosts out of 18 ft. 2x4s or 2x4 scraps that may be lying around, making five lengths 4 ft. 6¾ in. and three lengths 4 ft. 10⅜ in. Notch these as shown on the Section on line Y-Y, cutting these notches the distances apart marked on the Ground Plan, Plate II, and make them just large enough so that the roosts will slip out and in without trouble, but being tight enough so that the roosts will not wiggle. It will take two 18 ft. 2x4s and a 5 ft. length of 2x4 for the above supports. Nail these to the cross partitions at the height marked on the Section, keeping them level and be sure that the notches are on the right side. The shorter supports go on the stud side of the partitions and the longer supports on the shiplap side, as shown on the Ground Plan. After these are nailed fast the roosts can be laid in place. Take another 18 ft. 2x4 and cut about a 12 ft. 8 in. length off of it and then take this piece and rip in two. Cut these up into eight pieces 1⅝x1⅝x3 ft. 2 in. long. Nail these on the partitions or walls vertically for stops for the canvas frame as shown on the Ground Plan and Sections on line Y-Y, Plate III. Fit them closely to the dropping board and to the sloping and horizontal rafters above.

Build the canvas frames out of the 1x4 in. stuff, dressing or planing it down to 3⅝ in. in width, taking off the rough edges. Take two pieces of the 14 ft. lengths and the four pieces about 5 ft. 8 in. long, remaining from previous cuttings, and cut eight 5 ft. lengths. Take four more pieces of the 14 ft. lengths and cut two 4 ft. 8 in. lengths and one 4 ft. 4¾ in length out of each. These to be used for the front frames. Take eight more of the 14 ft. lengths and cut eight pieces 8 ft. 10 in. long and cut the ends remaining to eight 2 ft. 10 in. lengths. Take the four pieces remaining from cutting the 5 ft. lengths as stated above and cut four 2 ft 6¾ in. pieces out of them. These pieces are for the frames in front of the roosts. In sawing these pieces off be sure and get all cut square so that there will be no botch work when they are nailed together. 18½ lineal feet of the 1x4 in. stuff should be reserved for the nests, which will take four pieces 4 ft. 6 in. long.

Take the 5 ft. pieces for the front frames and notch them as shown on the Detail entitled "Corner of Frames for Canvas," on Plate III, being careful to get the cuts square, and assemble the pieces as shown on Plate III on the Section on line Z-Z, and nail them together, using the 20d finishing nails as marked on the Detail, and keep everything square. Cut notches in the ends of the 8 ft. 10 in. lengths the same size as the notches in the other pieces and assemble these pieces as shown on the Section taken on line X-X, and nail together, using 20d. finishing nails, the same as for the other frames. After these frames are solid and square and all of them nailed up, stretch the canvas on them, using about 9 lineal feet of the 30 in. canvas for each of the front frames and 8 ft. 4 in. of the 36 in. canvas for each of the frames in front of the roosts. Stretch this canvas tight and secure with 3 oz. tacks, driving them about 3 in. apart. This completes the 8 canvas frames, all except hanging.

The doors are not made yet so cut twenty 6 ft. pieces of shiplap for them and eight pieces 2 ft. 1 in. long for battens. Take seven pieces of 18 ft. shiplap to cut the 6 ft. lengths out of and cut the battens out of the remaining and other short pieces of shiplap or use other ⅞x8 in. lumber that may be around, or if necessary cut the battens out of an 18 ft. length of shiplap. The shiplap battens are to have the rebates planed or sawed off of both sides. Place the shiplap pieces together, four or five for each door, keeping the ends even and nail the battens on the back securely, keeping the shiplap together tightly so the door will not sag. Plane the edge of the shiplap down so that three of the doors will be 2 ft. 4 in. and one 2 ft. 2⅜ in. wide, fitting them in their respective places as shown on the Ground Plan.

Take pieces of waste shiplap or remaining pieces of 1x4 or other pieces of ⅞ in. lumber and rip into four pieces about 1⅝ in. wide and about 6 ft. long and nail onto the side of the stud that forms the striking jamb of the door, for a stop, and to form a rebate for that side of the door. These strips to fit tightly against the sill and against the cross piece at the head of the door, and the outside edge should be flush with the outside edge of the stud, and nail in place with 8d nails. Put the 6x4 in. tee hinges on the doors, two to each door, placing one hinge over each batten so that the screws can get a good hold through the two thicknesses of lumber and hang the doors in place, being careful that the hinges are set true so that they will not be wrenched off when the door is opened. Put the hooks on the doors and the staples on the side jambs and the doors are finished.

Now hang the canvas frames. Make twenty ⅞ in. blocks about 3⅝x5 in. for use as hinge blocks and nail these on the canvas frames, three on each of the roost frames and two on each front frame, placing them as shown on the Sections. After nailing these fast secure the 4½x3½ in. tee hinges on them, the triangular part of the hinge being fastened to the frames as shown. Be sure that they are true and all on a line so that they will open and close properly. After the hinges are secured to the frames, lift the frames in place, screw the tee fast, after chiseling a little out of the 2x4 on which the frame is hung, if the frame does not strike the 1⅝x1⅝ in. stops at the roosts or strike the projecting ends of the shiplap in front. This is necessary to make a tight job so that the wind will not have too much of a chance to whistle in through wide open places caused by carelessly hanging the frames. Hinge all the frames in this manner, being careful that they are all horizontal and swing freely. Put the 16 small hooks in the 2x4s at the bottom of the frames, placing two for each frame, and place two eyelets in each of the frames, and place the 16 long hooks in the ceiling, two for each frame, all as shown on the Sections on Plate III. These long hooks may be made of common baled hay wire and hung with a bent nail at the roof, so that you will not need to buy the 16 8 in. hooke and eyes. It would be better if the hooks are to be home made to get 16 small eyelets and screw in the ceiling, making a very much better and substantial job than the bent nails.

Take the 5 ft. wide poultry wire and cut four lengths 5 ft. long off of it and tack it in place over the front opening, stretching it taut and placing the staples about 4 in. apart. This wire goes on the outside of the shiplap. Take the remaining poultry wire and cut three lengths of 8 ft., which is to go over the openings in the partitions. Put this on in the same way as the other wire, making it tight and nailing staples about 4 in. apart.

Mix up the white lead and oil and put in a little turpentine for painting the exterior. If you have provided the ready mixed paint the above mixing and materials will of course not be needed. Paint the outside of the building, including the outside of the canvas frames, under side of the eaves and all ends and edges that are exposed to the weather, giving all a good coat, well brushed out, so that it will not be thick in some places and thin in others. This should have another coat but it can be put on at your leisure. For whitewashing mix the lime with water, getting it about the consistency of thin cream and spread it on the inside of the building, filling the cracks thoroughly. Coat all of the interior with this except the roosts and the tops of the droppng boards, which are to receive a thorough coat of crude carbolic acid or creosote, whichever you have provided.

The nests and drinking fountain stands are to be built so as to have them ready so that they can be coated with crude carbolic acid or creosote at the same time that the roosts and dropping boards are. Take the two 18 ft. 1x12 in. boards and cut them into eight 4 ft. 6 in. lengths for the bottoms and doors of the nests and take the two 16 ft. boards and cut them into twenty pieces, 1 ft. 7 in. long, for ends and partitions. Cut the two pieces of 18 ft. 1x6 into eight 4 ft. 6 in. lengths for fronts and backs of the nests, as shown on the Detail on Plate I. Cut the 18 ft. 6 in. of 1x4 that you have laid aside into 4 ft. 6 in. lengths for the top members of the front. Now nail these pieces together as shown on the Detail, using 8d. nails. Hinge the door with the two 2x2 in. hinges furnished for each nest and put a knob in place in the center at the bottom, to make the opening of the door easy. After the creosote or crude carbolic acid has dried, shove these nests under the dropping boards until the projecting edge of the upper 3⅝ in. boards strike the 2x4 as shown on the Drawings. Open the door and fix the nests and the hens will find the way to enter same from under the dropping board. Build the drinking fountain stands out of the remaining pieces of shiplap or other 7 or 8 in. stuff, as shown on the Sections, taken on line Z-Z, making the square opening just large enough to take the drinking fountain you contemplate using, and placing the bottom cross board about 6 in. or a little less from the floor. Creosote these and nail them to the wall as indicated on the Drawings.

After all this work is done and the paint and whitewash, etc., is dry, place a feed hopper and a feed trough in each compartment, place the drinking fountains, fix up the nests with straw or hay and scatter some littre on the earth floor, and the house is ready to receive your birds.

Corrugated Iron Bent over Ridge

2"x6" Rafters 10'-6" long

22 Gauge Sheet 2½" Corrugated Iron.

Strip cut off of these pieces to be used for ridge.

2"x4"x3'-3 9/16"

2"x4"x3'-0 3/8"

3'-0 3/8" Long

3'-3 9/16" long

2"x6"x16'-0" Ceiling Joists

1 5/8"x1 5/8" Strip on top of 2"x6" Cap Plate 19'-8" long.

30"x16" Ditto 3 Lts Sq.

Ditto

2½" Corrugated Sheet Iron

Corrugated Iron

2"x6"x3'-0 3/8" fitted betw. 3'-0" high Studding

*2"x4"

2"x6"x19'-8" Sill plate

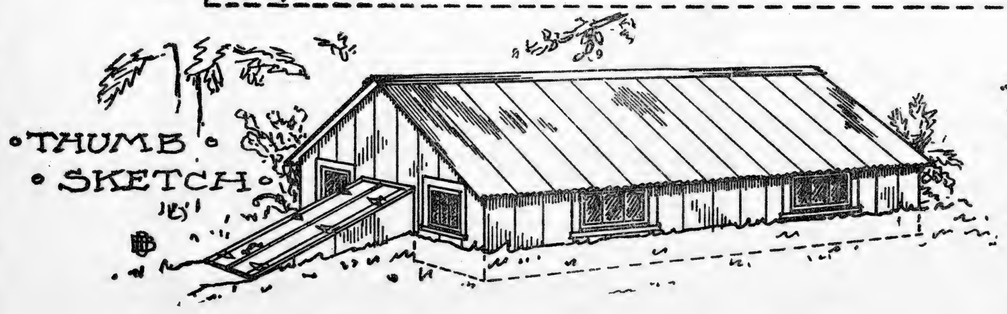
Rubble stone wall

Cellarway

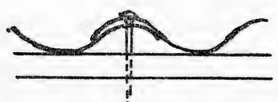
8" Glazed Tile Vent Stack.

◦RIGHT◦SIDE◦ELEVATION◦

Left side Elevation will be the same as this except that it is reversed.



◦THUMB◦ ◦SKETCH◦



Enlarged Section Showing how Corrugated Iron is to be lapped.

Corrugated Iron

Head 1 5/8"x9½"x4'-3¼"

2"x6"

7/8"x2"x4'-4"

7/8"x2"x3'-10¼"

Tin Covered 7/8"x5"x4'-0" Batten

7/8"x2"x6'-6½"

7/8"x2"x6'-6¼"

Jamb 1 5/8"x9½"x6'-6¾"

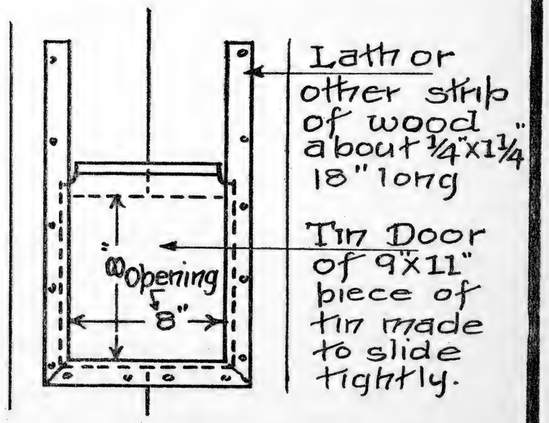
Tee Hinge

4'-0"x6'-6" Door built of 1"x6" fence flooring

◦ENLARGED◦DETAIL◦ Showing construction of Door and Door Jambs.

Tin Lining turned into Opening

Tin Rolled to form Handle and stiffener



◦ENLARGED◦DETAIL◦ ◦of◦VENTILATING◦ ◦OPENINGS◦IN◦DOOR◦

Scale 0ft 1ft 2ft 6ft

KELLERSTRASS PLAN OF

FIREPROOF INCUBATOR CELLAR

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

PLATE ◦I◦

FIREPROOF INCUBATOR CELLAR

BILL OF MATERIALS.

Below is given the quantities of materials for three different kinds of walls out of which select the one that can be most readily built, and for which the material can be bought for the least money in your locality. The reason the stone wall is shown on the Drawings is because that is the material used in the Incubator Cellar on the **Kellerstrass Farm.** The other materials, viz.: brick and concrete, make excellent walls, so it is only a matter of cost that will decide in this case. The material billed below the wall items will be the same regardless of the kind of wall chosen.

16 in. Rubble Stone Wall. 520 cubic ft. of wall.
- 31½ perch of Rubble Stone, 16½ cu. ft. to the perch.
- For Cement Mortar, 1 to 4 mixture, 13 bbls. cement, 7 cu. yards Sand.
- For Cement Lime Mortar, 1-5-½, 9 bbls. cement, 8 cu. yards Sand and 8 bu. Lime.
- For Lime Mortar, 24 bu. Lime and 7 cu. yards Sand.
- Use the kind of Mortar best suited and the easiest to get in your locality, and per the description under the heading "Mortar."

13 in. Brick Wall. 390 cu. ft. of wall.
- 7000 Hard Burned Brick.
- For Cement Mortar, 1 to 4 mixture, 10 bbls. cement, 6 cu. yards Sand.
- For Cement Lime Mortar, 1-5-½, 7 bbls. cement, 8 cu. yards Sand and 7 bu. Lime.
- For Lime Mortar, 20 bu. of Lime, 7 yards of Sand.

10 in. Concrete Wall, 325 cu. ft. of wall.
- 13 bbls. Cement, 6 cu. yds. of Sand, and 12 cu. yds. of Aggregate. This Aggregate may be crushed rock, gravel or cinders. Concrete to be mixed 1-3-6.

Concrete Floors, 320 sq. ft. of floor.
- 3 bbls. Cement, 1½ cu. yds. sand, 3 yds. crushed rock, for 2 in. base.
- 3 bbls. Cement, 1½ cu. yds. sand, for 1 in. top coating.

Anchors: Per Detail, procured at a Blacksmith's or Builders' Supply House.
- 6 Anchors ½x12 in.
- 2 Anchors ⅜x8 in.

Glazed Sewer Tile—for Vent Stack:
- 6 24 in. Section of 8 in. Tile.
- 1 90 degree Elbow.

Porous Drain Tile:
- Get about 80 lineal ft. of 4 in. porous drain tile in addition to the glazed tile, if the ground is moist where the Cellar is to be built, and also get an extra cubic yard of Crushed Rock or Gravel.

Piping—for Floor Drain:
- 1 perforated Floor Drain face or cover, or if you wish, take a heavy piece of galvanized or sheet iron and make it yourself by punching ⅛ or 3-16 in. holes through the piece.
- Enough 2 or 1½ in. pipe to reach from the drain to a low place in the grounds, with the necessary couplings, or to a cess-pool, as stated later.

Tin—for Door:
- 30 sq. ft. heavy weight tin, soldered into one sheet about 4 ft. 3 in. by 7 ft. with lock seams.

Corrugated Sheet Iron:
- This may be gotten galvanized or ungalvanized, as you desire, the galvanized being the best.
- 624 sq. ft., 24 in. wide, 2½ in. corrugation, 6 ft. long, for roof and gables.
- 194 sq. ft., 24 in. wide, 2½ in. corrugation, 7 ft. long, for sides and ends.
- 126 sq. ft., 24 in. wide, 1¼ in. corrugation, 7 ft. long, for interior.
- 480 sq. ft., 24 in. wide, 1¼ in. corrugation, 10 ft. long, for interior.

1424 sq. ft. Total.

Asbestos Paper:
- 1300 sq. ft. of heavy weight Asbestos Paper.

Lumber:

2x4 Dimension for framing.
- 40 sq. ft., 20 ft. lengths, 3 pieces.
- 28 sq. ft., 14 ft. lengths, 3 pieces.

68 sq. ft. Total (Board Measure.)

2x6 Dimension.
- 154 sq. ft., 22 ft. lengths, 7 pieces.
- 100 sq. ft., 20 ft. lengths, 5 pieces.
- 162 sq. ft., 18 ft. lengths, 9 pieces.
- 144 sq. ft., 16 ft. lengths, 9 pieces.

540 sq. ft. Total.

2x10 Dimension.
- 30 sq. ft., 18 ft. long, 1 piece.

1x6 in. No. 1 Fence Flooring for Doors.
- 77 sq. ft., 14 ft. long, 11 pieces.

No. 1 Sheathing Boards.
- 35 sq. ft., 1x6 in., 14 ft. long, 5 pieces.
- 84 sq. ft., 1x8 in., 14 ft. long, 9 pieces.

119 sq. ft. Total.

1¼x10 in. Board for Window Sills.
- 29 sq. ft., 14 ft. long, 2 pieces.

Glazed Sash:
- 16 Sash, 30x16 in., Single Strength Glass, divided 3 lights.
- If you choose to have the 8 frames for these sash made at the mill per the Detail on Plate II, you will not need the following lumber: 29 sq. ft. 1¼x10 in. board, 37 sq. ft. 1x8 in. board, and 7 sq. ft. 1x6 in. board.

Lumber for Forms for Concrete Walls:
- If you build the concrete wall, you will need about 850 sq. ft. of sheathing or other lumber that is suitable.

Hardware:
- 9 tee hinges, 6 in. x 4 in. or larger, with screws.
- 2 handles and hasps or straps for doors.
- 32 3x3 in. hinges for sash.
- 32 Sash fasteners for same. This can be lessened to 16 by placing the sash fasteners in the center of the sash, instead of at the sides as hereinafter described.
- 6 lbs. 10 penny (d.) and 2½ lbs. 20 d. nails for framing.
- 3 lbs. 8 penny nails for miscellaneous purposes.
- 3 lbs. 4 penny galvanized roofing nails with washers for corrugated iron.
- 1 lb. 3d. nails and some broad headed slaters' nails.
- ½ lb. 3-oz. tacks for paper.

Paint:
- 5 gals. Ready Mixed Paint for two coat work.
- If you wish to mix your own paint, get 80 lbs. White Lead, and 4 gals. Boiled Linseed Oil and some Turpentine or Drier.
- If you wish to color it, get colored pigment of the color you desire, to mix in.
- Get 60 lbs. White Lead and 20 lbs. Zinc White, and 4 gals. Boiled Oil for a Zinc and Lead Paint.

HOW TO PROCEED WITH THE WORK.

Grounds: Select a piece of ground that is about 19x21 ft. with enough room in front to allow for the projection of the stairway a shown on the Ground Plan, Plate IV, and that lies in a comparatively dry place, to eliminate, if possible, the use of the porous drain tile around the outside walls as shown on the Sections on Plate III.

Laying Out: The outside measurements of the building are 18x20 ft., and use a tape measure to run all these measurements with. Stretch a line along the 20 ft. side, driving the stakes at least 4 ft. further apart, so as to get them well outside of the excavation. Now run a line across the end, driving one stake about 2 ft. outside of the side line and far enough in from the side line stake, so that the lines will cross about 2 ft. from each stake. Now at least 22 ft. away from this end line stake, drive another to hold the other end of the line, being careful to drive it so that the corners formed where the side and end lines cross will be absolutely square. Try the corners with your steel square and then prove them by measuring 6 ft. out from the corner (where the lines cross) on the end line, and 8 ft. out from the crossing on the side line, and then measure across on the diagonal, from the 8 ft. point to the 6 ft. point, and, if the corner is square, the diagonal will be exactly 10 ft. Now drive the stakes for the other side and end lines, keeping them even with the stakes already driven and stretch lines across them, forming a space, 20x18 ft. inside. Be sure and get the corners square, checking all of them up as above stated. Measure off a space 6 ft. 4 in. x 6 ft. in the center of the front end of the building for the stairway, as shown on the Plan, marking it on the ground with a spade or shovel, leaving a well defined mark.

Excavating: About 6 in. outside of the lines giving the size of the building, make a good, visible line all around the building, by pushing the spade into the ground and moving some of the earth toward the inside, so as to leave a clearly defined mark by which to excavate. Now take the lines down off of the stakes, but do not disturb the stakes, and, in shovelling the earth out of the excavation, take care that the stakes are not knocked out of line and position by the flying shovelfulls of earth.

The lines removed, proceed with the excavation, shovelling out all of the dirt inside the marks you have made on the ground, to a depth of 5 ft. as shown on the Sections on Plate III, and excavate for the stairway, making a square, downward cut at the end as shown on the Section taken on line B-B and then sloping it, after leaving a 12 in. shelf for the wall as shown. At the sides cut steps in the ground for the outside walls as shown, making these about 12 in. wide, as shown on the Drawings. Be careful that you do not cut away too much earth so that you will not have to do any filling, for filled-in earth is not very good to build on. Make the floor level, and tamp it down solidly, filling in any hollow places and tamping these down solid.

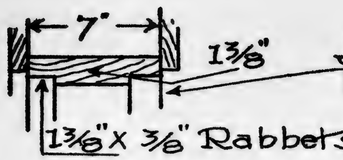
Leave the excavated earth in a pile around the building, for some of it will have to be shovelled in around the wall, and the rest banked against the wall of the building, as shown on the Sections and Elevations.

From the side or the end of the excavation that is closest to a low part of your grounds, dig a trench for the pipe that is to carry the water from the drain in the cellar floor to the outside. The bottom of this trench to have a slight slope so that the water will flow out easily through the pipes when they are laid. This trench needs only to be wide enough to allow of working in it and of a depth sufficient to get the slope as above stated. If there is no low place in your grounds to which you can run your drain pipe, run the trench to your cess-pool, which of course will necessitate more extensive plumbing, as hereinafter described. If the ground absorbs water easily, run the trench about 20 ft. out from the building, sloping the bottom, and terminate there, digging a hole at that point into which to pile crushed rock to receive the end of the pipe, as described later.

Dig a vertical channel in the center of the rear earth wall, for the 8 in. vent pipe, as indicated on the Drawings.

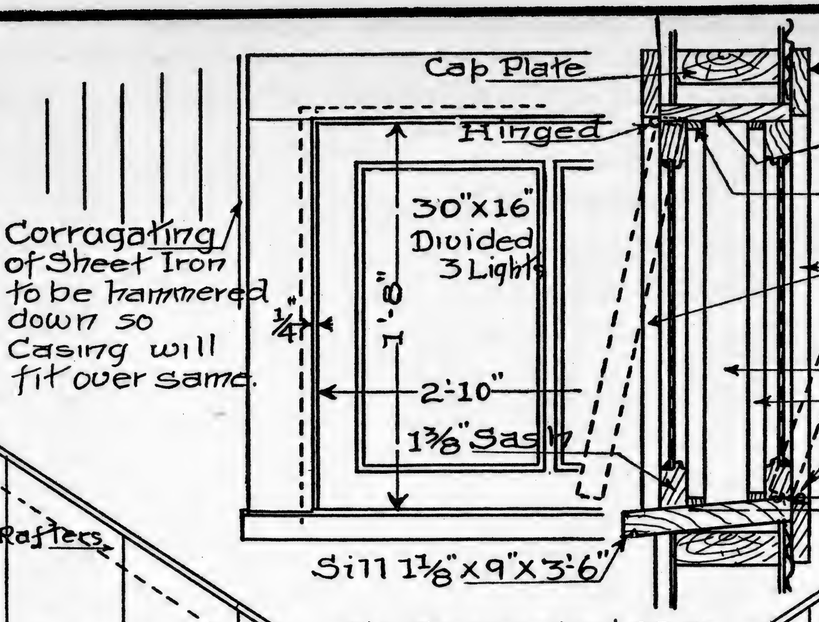
All the excavation done, the lines may be put up again, after having shovelled the loose earth back a little from the edge of the excavation, and then try the corners and check the measurements so as to be sure that the stakes have not been moved.

Drain Tile and Drain Pipe: If the ground in which this cellar is to be built, is of a moist, wet character, so that you may have trouble with water seeping in through the walls, lay porous drain tile around the outside of the excavation as shown on the Sections, making the excavation a little larger at the bottom, so that the tile will be entirely outside of the line of the wall. Lay this tile in a bed of crushed rock or gravel, as shown and with open joints, so that the water will have all possible chance of getting into same. Run the tile down into the trench for the other drain pipe as far as it will go, ending in a bed of crushed rock or gravel, to spread the water so it will have a better



Jambs to be housed into head & sill

•DETAIL• Showing construction of Jambs if same are obtained from a mill.



Corragating of Sheet Iron to be hammered down so Casing will fit over same.

Top & Bottom Casings ⅞"x3½"x3'-5½"

Head ⅞"x7"x2'-10"

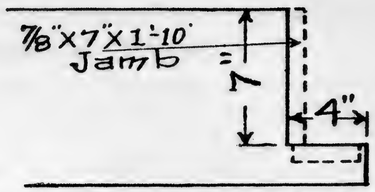
Top Stops ⅜"x⅞"x2'-9¼"

Side Casings ⅞"x3½" x 1'-8¼" outside and 1'-7¾" long inside.

Side Jambs ⅞"x7"x1'-10"

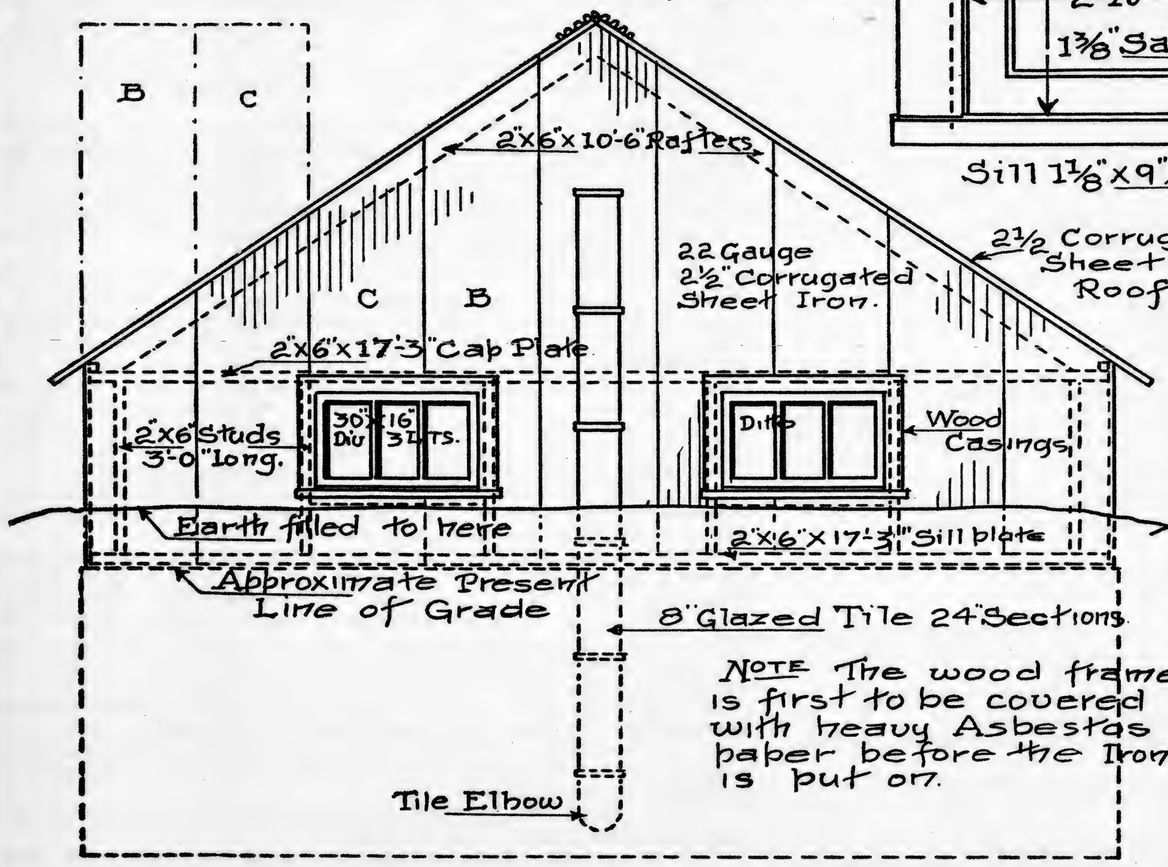
Stops 1'-8" long

Hinged



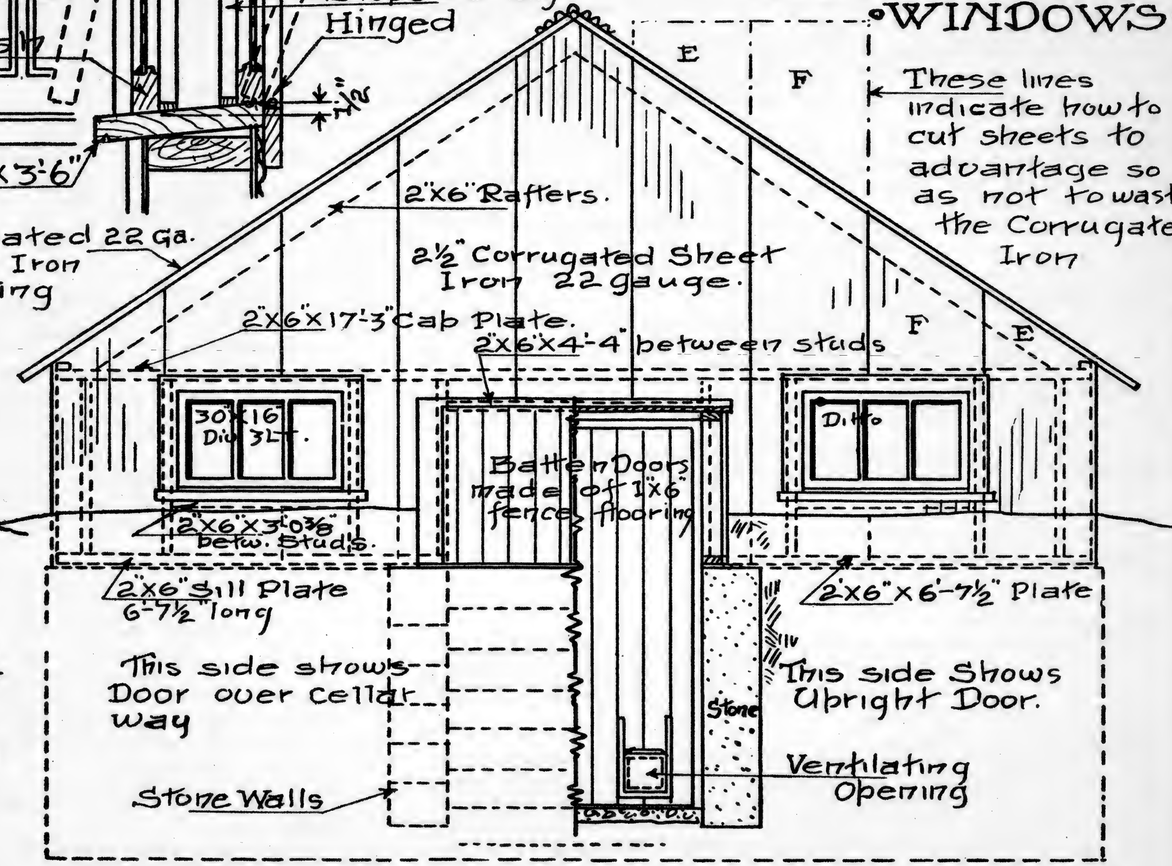
Plan of Ends of Sill

•ENLARGED• •DETAILS• of• •WINDOWS•



2½ Corrugated 22 Ga. Sheet Iron Roofing

NOTE The wood frame is first to be covered with heavy Asbestas paper before the Iron is put on.



These lines indicate how to cut sheets to advantage so as not to waste the Corrugated Iron

• REAR • ELEVATION •

• FRONT • ELEVATION •

KELLERSTRASS PLAN OF

FIREPROOF INCUBATOR CELLAR

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0ft 1ft 2ft 3ft 4ft

PLATE •II•

chance to soak into the earth. Do not use the rock or gravel you have provided for concrete, but get an extra cubic yard of this material for this purpose.

Lay your 2 in. or 1½ in. iron drain pipe, whichever you have provided, in the trench dug for it, letting it project slightly out of the ground on the low side and letting it come far enough into the excavation so that it will be inside of the wall and have the lower edge of the end about flush with the floor as it now is and dig out a space or pocket to be filled later with concrete to form the drain. Place a board over this so that this hollow will not become filled with dirt and also keeping the end of the pipe from getting choked up. The severel lengths of pipe that will be necessary, depending on the distance from the excavation to the low part of the ground, to be screwed together with the couplings provided with each length of pipe.

If there are no low places on your grounds, as stated in the paragraphs under "Excavation," run the outside end of the pipe into a pile of crushed rock or gravel, the same as done with the drain tile, and let the ground absorb the water that can spread out in the voids between the particles of rock or gravel. Make a fairly large sized pile of this rock and let the pipe come in at the top, which, of course, is to be below the level of the floor of the Cellar. Lay a few pieces of boards over the rock and fill in the earth over these and over the pipe and drain tile.

If you run this drain pipe to your cess-pool, provide a trap and check valve, or, better still, get a floor drain that has these contained in itself, and connect all up properly, making tight joints in all parts, cementing the end of the pipe into the cess-pool and screwing it fast to the floor drain with the coupling provided. Set the floor drain so that the face of it will be about 2½ in. above the earth floor, and so that it will be well within the wall.

Shovel the earth into the trench, heaping it up and tamping it and the plumbing part of the work is done.

Foundation Walls: The above part of the work will have to be done as described, no matter which kind of wall you select, as the outside size of the walls will all be the same. Select the material that is most suitable in your locality, as stated in the Bill of Materials.

Rubble Stone Wall: This is the cheapest kind of stone wall that can be built and consists of common stone from the quarry laid up in mortar, with joints that run in all directions, depending upon the shape of the stone, on which no tool is used except the stone hammer to break them up into suitable sizes.

Drop a plumb line from each corner at the crossing of the lines marking the corners. Now select some of the larger stones that have flat bottoms and bed them solidly on the ground, using mortar if necessary. The mixing of the mortar will be described later under "Mortar." Lay these stones all around the wall, laying them as straight as they will allow, so as to make a straight wall and lay them so as to make a 16 in. thick wall, and so the corners will be directly under the corners of the lines above. Slush the joints full of mortar and spread mortar over the top face and lay the next row of stones on top, hammering off the irregular sides and edges, so that they will fit in the irregularities of the stone below. Continue this until the wall is built, building up the corners first, so as to get them square and plumb, and fill in between as you work along, filling all the joints with mortar and filling the small hollow spaces, of which there are usually many, with spalls and pieces chipped off of the stone in handling and in fitting.

Leave the opening for the 8 in. vent tiles at the back and the door opening in the front, taking care to get the ends of the wall or jambs straight and plumb, and slush mortar in between the wall and door frame, which should be set as described under "Door Frame" following.

Do not forget to bond the walls, which means to place a large stone every so often that will go clear through the wall, and have an even bearing, thus tying the wall together which is necessary to make a strong and durable wall, especially if the stones are small, which will make a joint in the middle of the wall, and, if not bonded, would be very poor construction.

The vent tile is to be set in and built up along with the wall, cementing the joints, so that there will be no work under the grade level on the outside of the wall, when the wall is completed.

A few of the irregular joints in the stone work are indicated on the Sections showing some of the many sizes and shapes that may be used. Keep the sides as near flush as possible, hammering off any unnecessary projections and spread mortar over the hollow faces of the stone to help make the wall straight and flush. Select the top row of stones with care, hammering them off on top, so that the wall will practically have a flat top and spread mortar over it to make it flat and level it up, using your level, and make the corners square so that it can be said, all is done in a workmanlike manner.

While the main walls are thus being built, build the walls on each side and across the end of the stairway, as shown on the Ground Plan and Sections, taking the same care to get these smooth and level on the sides and on the top as for the main walls, and bond them securely with same.

Before laying all of the top course of stone place the iron anchors in position as shown in the Sections and locating them as shown and marked on the Ground Plan and as described later under "Anchors and Plates."

Coat the outside of the wall with a half inch coat of cement mortar to make it approximately water-proof.

Brick Walls: Any good common, hard burned brick will do for this wall, and, if they are of a kind that will absorb water, wet them thoroughly before they are used so that they will not absorb the moisture from the mortar.

Drop a plumb line from the crossing of the side and end lines to establish the corners at the bottom of the excavation where the work of laying the brick commences. Stretch a line from corner to corner about 6 in. from the ground, which is of course well tamped and clear of loose earth, etc.

Spread a layer of mortar on the ground about 13 in. wide, and lay one row of bricks with the ends toward the line, on the outside, called a header course, and one row inside laying these lengthwise with the wall, which is called a stringer or stretcher course, making the wall about 13 in. wide and press every brick down into the mortar as you go along. Spread the mortar on the ground, only as you follow up with the bricks, so it will not have a chance to set before the bricks are in place. Lay this all around the building forming the base or first course.

Now, commencing at the same corner as before, spread mortar over the outside 4 in. of the wall as far as you can reach with one stroke, and as far as a trowel full of mortar will go, and fill up the vertical joints in the first course on the outside, and lay another stretcher course of brick on top of this mortar, laying these lengthwise with the line, as indicated by the name, stretcher course. Do this the entire length of the side, filling up the vertical joints between the bricks with the mortar that is squashed out on the outside when the brick is pressed down, scraping it off of the side with the trowel and then scraping it off the trowel onto the end of the brick, drawing the trowel over the vertical edge of the brick laid. Pick up another brick, press it down against the brick already laid, scrape the squashed out mortar off the outside, put it on the end of the last brick laid and then put another in place, and continue the operation all the way through, thus wasting no mortar. The mortar is to be put on thick enough to make about a quarter of an inch joint, which you will soon learn to do after a little practice and experimenting. After this second string course is laid, spread the mortar over the 8 in. remaining, of the wall and lay a course of headers, that is with the end of the brick showing on the inside of the wall. Put the squashed out mortar on the edges of the brick, the same as described above and lay another brick pressing it down into the mortar and so continue until the headers are all laid on that side. Now go over the top, spread some mortar over it, forcing it into the vertical joints of the bricks, leaving a mere suggestion of mortar on the top of the now two course high wall. Continue this operation on the other three sides and ends, laying the headers on the inside and the stringers on the outside, just the reverse from the course below.

See paragraphs under "Mortar" for how to mix it, etc.

After these two courses are laid all around the building set the door frame up in position as described later under "Door Frame," and place the horizontal sections of the vent tile in position, laying brick around it to hold it in place and cement the joint where it joins the elbow, which also put in place. Put the vertical sections in as the brick wall is built up, filling around them with earth to hold them in position.

Now commence at one corner and build up five courses high, laying all the brick stretchers, that is, laying lengthwise with the wall, and be sure to bond these well at the corners, which is done by letting one brick lap over the other so that no joints come directly over the ones below, without a brick between, and make the vertical and horizontal joints about a quarter of an inch or they may be made a little more to keep the courses level. These built up corners to step down in each direction, down to the original two courses and then stop, each step being a half a brick. Build up with brick on each corner in this way, being sure that the corner is plumb and square and well tied or bonded together, and now raise the lines that were near the ground and tie them onto a nail, stuck in the mortar under the top brick.

The lines up, lay the brick between these built up corners, laying the brick all stretchers until they are flush with the top of the corners and all sides are laid and the top of all walls on a level, and now the wall is seven courses high. Remember in laying these stretchers to break joints, both vertically and horizontally, that is, lay the bricks in one course so that the joints will come over the center of the bricks below and lay the next course on top so that its joints come above the joints in the second course away from or below it, so that every other joint will be above each other. Horizontally lay the inside and outside four inch course with joints even. In the middle course the joints are to come in the center of the outside bricks.

On top of these five courses of stretchers lay two courses of headers and stretchers in the same way as done for the first two courses laid, letting the headers in one course come on the inside of the wall and those in the other, on the outside. This is called, "bonding the wall."

Lay the rest of the wall up in the same manner to a height of five feet, bonding it every fifth course and laying the top course so that the sill plate will rest on a header course.

Build the brick area walls around the stairway in front, in the same manner described for the other brick work and carry them up at the same time, but make the walls only 9 in. thick instead of 13, and make the inside of this wall so it will be flush with the brick reveal of the door jamb and bond it securely with the main wall. The top course of this wall to be headers, also.

Before laying the top few courses of bricks set the anchors in their proper places, as shown on the Ground Plan, Plate IV, so they will strike the center of the sill plate, and brick them in solidly when laying the upper courses. See "Anchors and Plates." Be sure and get all the walls level on top and to assure getting this, keep the corners as they are built up all level and at the same height, and if the walls are not level, tear some of it down and rebuild, making the joints thicker or thinner as the case may warrant, until you reach the desired end.

Mortar: The mortar for both the rubble work and the brick work can be the same, although the quantities may vary a little as indicated by the Bill of Materials. In the following paragraphs three different kinds of mortar are described. Use the one most suited to your local conditions. Any of the three will make a good wall.

For the mixing provide a water-tight box, about 4 ft. by 6 or 7 ft. long, and 8 or 10 in. deep, with the ends made slanting, to make the handling of the mortar easier. Build this out of any old lumber you have around the place, making it nearly water-tight by nailing well together, and then the wetting will swell the lumber sufficiently so that it will hold water. Do not mix any more cement mortar at the time than you can use up in three or four hours, for after that the cement will start to set and after the cement has started to set, it ought not to be used.

A good standard brand of Portland Cement is to be used and the Sand should be clean and sharp and free from dirt and other foreign matter, and not too fine, for the finer the sand the more cement it will take. Using a bucket or a shovel for the measuring medium, measure off one part portland cement to every four parts of sand and thoroughly mix it dry, turning it over and over with a shovel or hoe until it is of a uniform color and then draw it up into one end of the box and pour water into the other, then wet and mix it in such quantities as can be used before the set begins, adding enough water so that it will be soft enough to allow the brick or stone to bed into it readily and work easily with the trowel.

The above is a strictly cement mortar. The following is a Cement and Lime mortar and may be found to be cheaper in some localities and some masons recommend its use above the cement mortar, for it works more easily under the trowel. Use one part of portland cement to every five parts of sand and thoroughly mix these dry as above described. Use fresh lime, using one bushel of lime to every barrel of cement, or one-half part of lime to every part of cement, measuring it dry or after it is slaked, three-quarter parts of the paste to every part of cement. Slake the lime in a water-tight box, spreading it on the bottom and covering it with water, then stir it

Pitch of Rafters
12" run to 8" rise.

2"X6" Ridge
19'-8" long

10'-6"

5 5/16"

3 3/4"

1 5/8"X1 5/8"X19'-8" long

1 7/8"

5"

3/16"

2"X6"X19'-8"
Cap Plate

ENLARGED DETAIL
Showing how to
cut Rafters.

6'-8"

5/8"

5/16"

3 5/8"

1 5/8"

3 5/8"

Showing
Bevels on 2"X4"
frame for
Cellar way.

2½" Corrugated Sheet
iron, 22 gauge
put on over
asbestos
baper.

2"X6"X19'-8"
ridge

2X4 Cut between
Rafters

2"X6" Rafters
10'-6" Long

2"X6"X16'-0" Long.

2"X6" Cap Plate 19'-8"

2"X6"X30"
long
Studs

28 Gauge
1¼" Corrugated
Iron
put on over
asbestos
baper.

Sash
hinged

2"X6"X3'-0⅜"
between
studs

2"X6" Sill Plate 19'-8"

½"X12 Anchors

8" Glazed
Tile. outside

Rubble Stone
Wall.

Stone

16"

Opening to
vent

Concrete
F'loor

Stone

Earth Filling

Present Ground
Level.

4" Porous drain
tile all around
building

Gravel.

2"X6"X19'-8" Ridge

2"X4"X3'-0⅜"

2"X4"X3'-3 9/16"

2"X6" Ceiling
Joists 16'-0" long.

2"X4"X19"
Uprights

2"X6"X4'-9"

1¼" Corrugated
Sheet Iron
28 Gauge.
over
asbestos
baper

Batten Doors
built of 1X6"
flooring
6'-4" long.

2X4X6'-8"
long.

2"X4"
2'-5" long

2"X4"
X5'-9" long

2"X4"
X1-2½"

Concrete
Steps

Batten Door

• TRANSVERSE • SECTION •
• Taken on Line • A • A •

• SECTION •
• On Line • B • B •

Scale 0 ft 1 ft 2 ft 3 ft 4 ft

KELLERSTRASS PLAN OF
FIREPROOF INCUBATOR CELLAR
AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

PLATE · III ·

with a hoe so as to let the water get to all sides of the lumps. Add enough water to make it off the consistency of thick cream. Let the paste thus formed stand over night or longer to allow it to cool, then add as stated above, three-quarter parts of this paste to every part of cement used and mix the cement and sand and lime paste until it is thoroughly mixed, adding enough water water to make it the proper consistency to work with, which with a little experimenting and experience will soon be learned.

Lime Mortar can be made as follows, and used if so desired, although the above mortars are recommended. Slake the fresh lime as above described and add water until it is about the consistency of thick cream. After this run it off through a seive and add the sand. The amount of sand used is to be regulated by the lime, as some limes will take more than others. The mortar should stand two or three days to cool off before using, and so that any small lumps of unslacked lime will have time to slack. In tempering for use add enough sand to make it work nicely and not stick to the trowel. Do not use this mortar in freezing weather, for freezing and thawing spoils it, and do not add much over four parts of sand to one part of lime.

Concrete Wall: Concrete is a mixture of broken stone, gravel or other similar material, called the Aggregate, held together by cement mortar. To build a concrete wall it is necessary to have forms or molds into which to pour the concrete.

Any pine lumber is all right to build the forms out of, providing it is solid and without loose knots, that would not hold the concrete while it is being rammed. These paragraphs will not attempt to describe, how to cut all the lumber for the forms and how to nail it, but will leave that to your good judgment, giving only a few directions.

Erect the forms so that they will make a 10 in. wall 5 ft. high, or in other words, put them up so that they will be 10 in. apart, each side 5 ft. high, and make the inner side of the outside forms come just below the lines so that the outside of the wall will be the size marked on the Ground Plan, 20x18 ft. Nail the boards for the forms on horizontally, placing the uprights of 2x4s or other size dimension lumber, about 2 ft. apart, and brace securely to the ground and tie the outside and the inside forms together, with hay baling wire, making them secure and solid so they will not bulge or give in any way when the concrete is being poured and rammed in place, so that you will have a good straight wall, when the forms are removed, after the concrete has set. The 2x4s and 2x6s that you have ordered for the frame, may be used in constructing the forms, but do ont cut it up, so that you cannot use it later for the purpose it is intended. Before cutting it at all, it would be a good idea to consult the Drawings and the following description, so that you will not waste material by injudicious cutting.

Put the door frame up in its place, letting it come flush with the inside of the wall or as stated under "Door Frame" and brace it securely. The concrete can be poured in against it so that it will form the end of the forms at the door opening. See paragraphs under "Door Frame." Place the horizontal piece of the vent tile at the back, in position through a hole in the forms so the concrete can be poured around it.

Build the concrete forms for the area walls around the steps, in the same manner and take the same care with these as with the other forms, so the walls will be all straight and true when the forms are removed. These three small walls do not need to be over 4 to 6 in. thick, so build the forms accordingly.

The hollow space between the forms show the shape of the wall and should be continuous all around the building, the only break being where the door in the front occurs. The area wall spaces should be continuous with the main wall, the inside of them coming flush with the outside of the door jamb or nearly so, but not extending out in front of same. Thus when the concrete is poured, the wall will be one homogeneous mass.

The forms, or moulds, as they might be called, all built and plumb and square and all solid and well tied together so they will not move, when pouring and ramming the concrete, proceed to build a tight platform for mixing the concrete on. This to be 8 or 10 ft. wide and 12 or 14 ft. long. and is to be laid flat and solid so it can be worked on.

This part of the work done, you are ready to mix and pour the concrete. Use a good standard brand of portland cement and use sand that is clean, coarse and sharp. Sand that contains dirt or other vegetable matter should not be used and it should not be too fine. A mixture of coarse and fine sand being best. The aggregate for the concrete can be broken stone or crushed rock as it is called, or gravel or cinders, or any of these mixed, so you can use the material that costs the least in your locality. The broken rock or coarse gravel is the best. The broken or crushed rock should be clean and free from dust and dirt, and should not be in larger pieces than would pass through a 2 in. ring, and should be in sizes ranging from ½ in. up to 2 in. It can be cleaned from dust by passing it over a ⅜ in. mesh sieve. The gravel used should vary from ¼ to 2 in. in size, and do not use smooth gravel if rough can be obtained, although the smooth will make a good concrete. If cinders are used get such as are nearly all vitrified clinkers and of a size that will not pass through a ⅜ in. mesh sieve and should contain very little unburned coal. Ordinary cinders are not fit for good concrete work.

The quantity of materials in the Material Bill is for a mixture of one part cement, three parts sand and six parts of aggregate. Do not mix larger portions of concrete than can be used at once. A mixture of concrete that has stood on the platform over three hours should not be used, for the initial set of the cement has by that time commenced, and in mixing do not spare labor, and turn the mass four or five times so it will be thoroughly mixed.

On the platform you have built, mix the cement and sand dry, using one part of the cement to every three parts of sand, and mix until it is of a uniform color and then draw it over toward one end and on the other end of the platform, spread six parts of the aggregate, broken stone, gravel or cinders, to every part of cement and three parts of sand. Wet the aggregate thoroughly, washing away any foreign matter and then spread the cement and sand on top, and then commence at one end of the pile and turn over toward the farther end of the platform, adding more water until the cement, sand and aggregate are wet and after the pile has been turned once, go over it again, and a third and fourth time, adding enough water so that the mass will quake, and flush water to the top when it is poured into the form and tamped. A little experience will soon teach you the proper amount of water and when the concrete is thoroughly mixed. The mixing is an essential part in the making of concrete.

When the first batch is thoroughly mixed, pour it into the forms in a layer 10 or 12 in. thick and proceed with the mixing of more concrete, pouring it into the forms and keep mixing and pouring until the top of the forms are reached, levelling it off so the walls will be square and level on top. Pour the concrete into the forms with care, not dropping it from too great a height, depositing it in layers about 10 or 12 in. thick as above stated, tamping each layer solidly until water comes to the surface and finish each layer all around the building before commencing the next. While the top layer is being poured, place the anchors for the sill plates in place, as shown on the Sections and on the Ground Plan, and as directed under "Anchors and Plates."

After the concrete is placed, let it stand in the forms for at least two days, wetting it thoroughly once or twice a day in hot, dry weather, so that it will not set too soon. After a couple of days the forms can be removed, cutting the wire used to tie the forms together off flush with the surface of the concrete.

Filling Around the Walls: The following work will all be practically the same, no matter which kind of wall has been built, except for the slight differences that will be noted as they are reached.

After the Mortar in the stone and brick walls has thoroughly hardened or after the forms for the concrete walls have been removed, and the concrete is well set, fill in around them with some of the loose earth piled around the building, putting it in, in about 12 in. layers and tamping it down solidly, so it will not settle the first time it gets wet on a rainy day. If the porous tile drain has been laid around the walls, cover it with broken stone or coarse gravel, per Sections, before shoveling the earth in. Be sure that the walls are thoroughly set before filling, so that they will not be bulged inward by this process.

Tile Vent Stack: The bottom part of the vent tile to be placed as stated in the descriptions for the different walls, placing the horizontal section in the walls as they are built, then cementing the elbow in place and put the vertical sections in place, cementing all the joints and fill around them with earth. Build this up to grade level, covering the opening with a board, or build it up to the height shown on the elevations and protect it with a couple 2x4s or other posts put into the ground to help support it. Cement all the joints with cement mortar, so they will be tight and hold the tile solid.

Concrete Floors and Steps: These floors do not need to be put in at once and may wait until the framing is up, but as it is in line with the other cement work, it will be taken up here and you can place it in after filling in the earth around the walls or later, to suit your inclination.

The floor is to have a concrete base 2 in. thick and it is to have a top coating 1 in. thick and is to slope to the drain. The steps are to have a concrete base with a top coating 1 in. thick.

The steps will have to have some forms which will only need to be 7 boards 8⅛ in. high by 4 ft. 4 in. long for the risers which are secured at each end near the wall to an inverted string piece, that is, a piece with the steps cut into it with these boards nailed on the risers and then turned upside down so that the string piece will not interfere with the concrete getting to the wall at each side. Set this form so that the concrete when poured will be 1 in. lower and further back than the finished step will be, as shown on the Drawings. Set this form in place, secure it solidly, and remove the braces holding the door frame, which by this time is held securely in place by the walls, and you are ready to place the concrete for the base.

The concrete for the base is to be mixed in the same manner as described for the Concrete Walls, using the same mixture, one part portland cement to three parts sand and six parts aggregate, which may consist of crushed rock, gravel or cinders as described above. Mix this thoroughly, using only enough water so that it will flush to the surface when the concrete is solidly tamped. Spread this out on the earth floor, spreading it until it is about 2 in. thick, letting it have a slight slope toward the drain and form the concrete down into the drain pocket or pit so that it will leave the end of the pipe about a ½ in. above the concrete. This hole or pit to be made round or square according to the shape of the perforated cover you have provided. If the floor drain is put in for the cess-pool connection, let the surface of the concrete come about an inch below the top of the drain. While spreading the concrete on the floor or maybe before, place the concrete in the forms for the steps, tamping it lightly so as not to bulge the risers, and place concrete at the base of the door to make a step there also, as shown on the Section on line B-B Plate III.

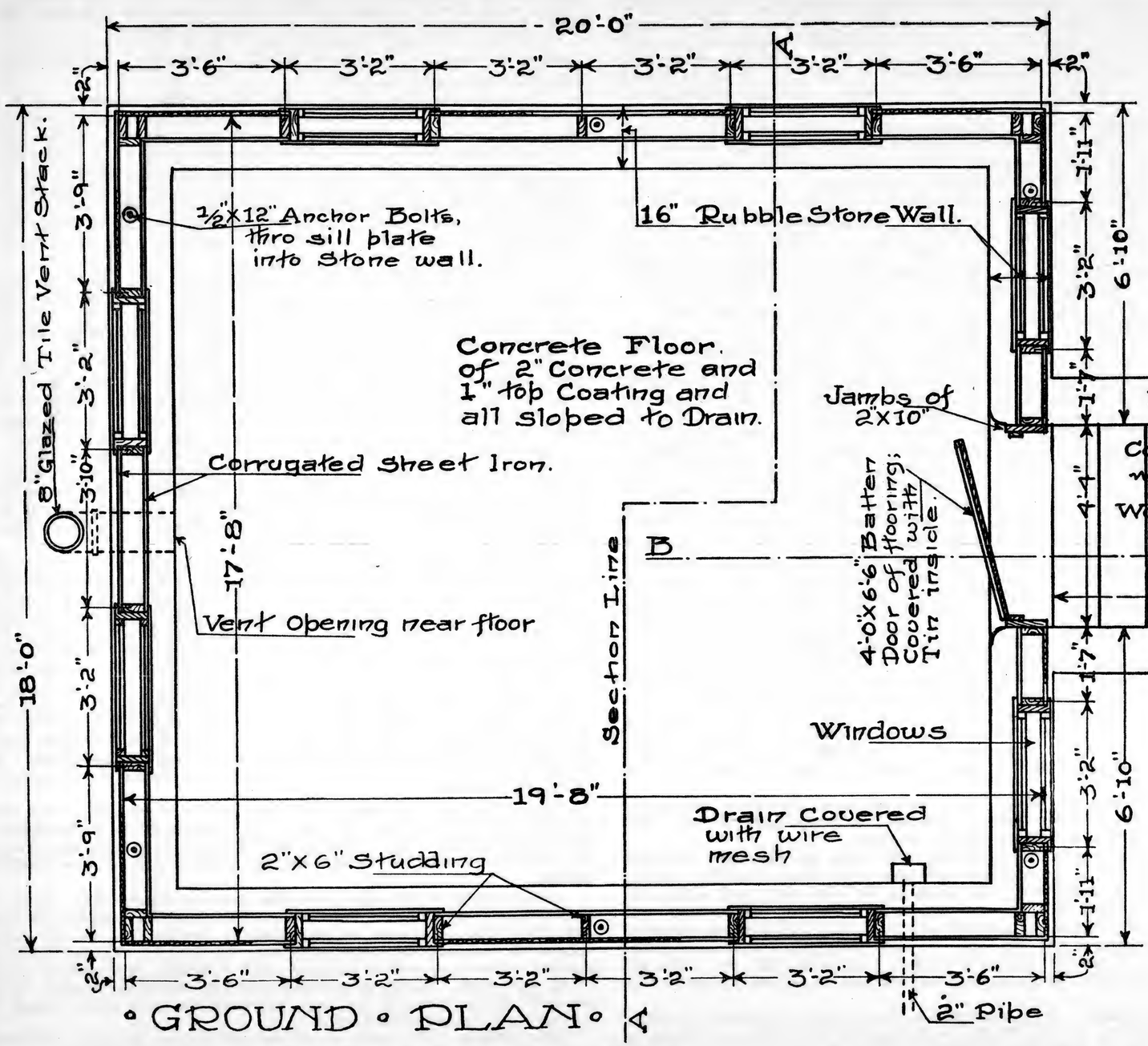
Allow this concrete base to set slightly so it will bear a man without quaking, and while this is setting, mix up the top coating which is to consist of one part portland cement to two parts of sand, thoroughly mixed dry, and then enough water added to make it work smoothly under the trowel. Do not let the concrete base get set too hard before applying this coating. Spread it on top 1 in. thick, letting it slope gradually to the drain, where form the pocket or hole for the drain, cementing the pipe in so that the water will run entirely into the pipe, without leaving any drippings in the bottom. Press the perforated cover into the cement so that the top of it will be flush with the cement, being careful so that no cement gets in front of the holes in the plate, or if the floor drain is in, bring the cement top flush with it. Trowel the floor down smooth, finishing with a sprinkling of dry cement, well troweled into the surface. This will all have to be done as you work along, doing no more at the time than you can handle with ease.

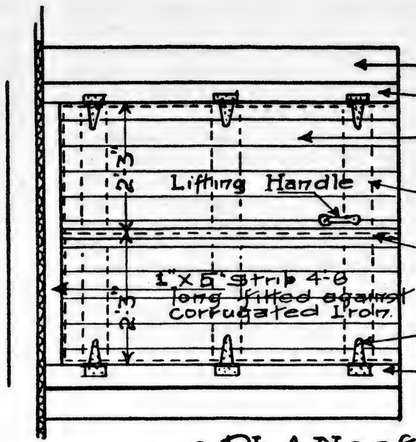
As soon as the concrete for the steps will hold up, remove the forms and give them a 1 in. coat of the above top dressing, in the same manner as above stated for the floor. Coating the tread and riser both, and trowel it out smooth, rounding the corners slightly, doing it all in a workmanlike manner.

Do not walk on the steps or on the floor for several days, until the floor is good and solid. If the weather is hot and dry sprinkle the floors and steps with water two or three times a day so that the top coating will not dry too fast and crack away from the base. If this is laid in cold weather, cover it up with a tarpaulin, and if freezing, use manure, so that it will not freeze. Of course it is better to wait for milder weather. If the sun beats down extremely hot, it would also be a good idea to shade the concrete and cement work from it.

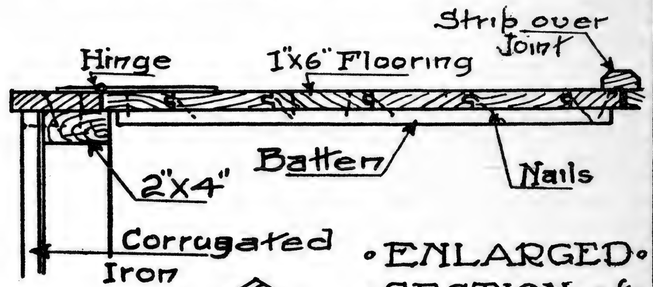
Door Frame: The frame for the upright door at the foot of the stairs will be one of the first things needed as soon as the walls are started, as you have doubtless already noticed, so you had better build it as soon as the excavation is done, so as to have it ready when needed.

Take the 18 ft. 2x10 which you have provided and cut off one length 4 ft. 3¼ in. and two lengths about 6 ft. 8 in. long, squaring up the ends. These pieces to have the rough edges planed off. Take the short piece, which is to be the head jamb, and with the surfaced side up make a rebate

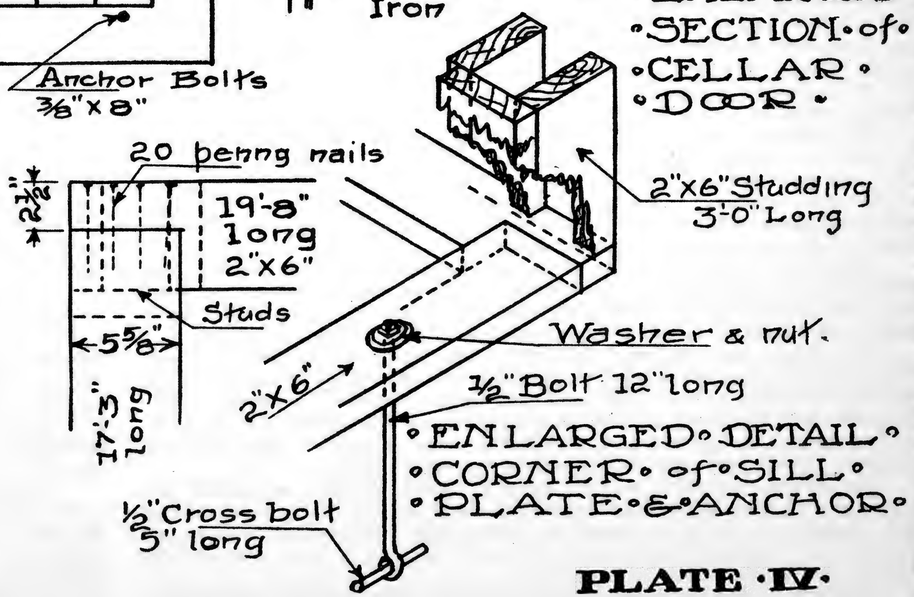




• PLAN • of • WOOD • TOP •
• for • CELLAR • WAY •



• ENLARGED •
• SECTION • of •
• CELLAR •
• DOOR •



• ENLARGED • DETAIL •
• CORNER • of • SILL •
• PLATE • & • ANCHOR •

KELLERSTRASS PLAN OF
FIREPROOF INCUBATOR CELLAR
AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0ft 1ft 2ft 3ft

PLATE • IV •

at each end as indicated on the Enlarged Detail, to receive the ends of the side jambs. These rebates to be 1⅝ in. wide and about ⅜ in. deep, and are to be exactly four ft. apart, measuring from the inside of one to the inside of the other. These rebates can be made as follows: Measure back 1⅝ in. from each end of the board and draw a line at right angles with the edge, using your square, and then make a mark ⅜ in. down on each edge, measuring from the surfaced side. Be sure that the lines marking the width of the rebate are 4 ft. apart. Now saw on these lines making a flat cut, ⅜ in. deep, sawing only to the mark, and then chisel off a 1⅝x⅜ in. piece and make the new 1⅝ in. surfaces flat and square, making a rebate of the size wanted at each end. Now put the ends of the 6 ft. 8 in. pieces, the side jambs, in the rebates, with the surfaced sides facing toward each other, and nail fast, nailing through the head jamb. Put a piece of any lumber 4 ft. long across the bottom and nail through the jambs into the ends of this piece and then square the frame up, making it perfectly true, and nail on solidly a couple diagonal strips, crossing each other, to hold the frame rigid, so it will not get out of square when handled. Now it is ready to be set in place.

After the walls are built to a height to allow of the setting of the frame, which height is stated under the headings for the different walls on previous pages, set the frame up in position in the middle of the front end, as shown on the Drawings, placing it so that the front edge of the jambs will set about 1¼ or 1½ in. back from the outside face of the wall and set at the proper height so that it will be 6 ft. 6 in. from the top of the finished step to the bottom of the head jamb, or about 7 ft. 2⅛ in. from the concrete floor, making it about 7 ft. 5⅛ in. from the earth floor to the head jamb. Block up under the ends of the side jambs to hold the frame up and run braces from the frame each way (inside and outside) to the ground, nailing them fast to stakes driven solidly into the earth. Before nailing these braces securely to the stakes, plumb the frame up so it will set vertical and square with the wall, and now the walls on each side can be built up to the jambs, being careful in so doing so as not to bend the jambs inward.

Drive three or four 6 or 8 in. spikes through each of the side jambs below the top line of the wall before the walls are built, to serve as anchors to help hold the jambs in place. In driving these spikes take care to place them so that they will come under the stops which will be nailed on later. See the Detail for the location of these stops. The braces can be removed when the walls are built to their full height and the cross piece at the bottom of the door to be removed just before the concrete for the steps is poured, bedding the lower end of the side jambs about 1⅝ in. into the concrete and cement top coating, holding the jambs securely.

Anchors and Sill Plates: The anchors which are of iron, and the 2x6 sill plates should be gotten ready at the same time as the door frame, so as to have them on hand when needed in the work.

The anchor bolts can be made by any Blacksmith or they can be obtained from some Building Material Supply House. They are to be the sizes marked on the Ground Plan on Plate IV, and are to be made as detailed on the same Plate, with bolts and cross bolts, nuts and washers as shown. Before the top layer of the walls, whether stone, brick or concrete are laid, place these anchors in position, bedding them well in the material of the wall and placing them so that they will come nearly in the center of the sill plate as shown on the Ground Plan, locating them as there shown, the 6 large anchors in the main wall and the two smaller in the side area walls of the stairs to hold the cellar-way cover in place, and place them all so that they will project about 2½ in. out of the top of the walls.

Take two solid 20 ft. 2x6s and saw them off to a length of 19 ft. 8 in. and cut a notch in both ends of each of them. These notches to be the size shown on the "Enlarged Detail of Corner of Sills" on Plate IV. These pieces are for the side sill plates—the notches are to fit over the ends of the end sill plates, for which pick out two 18 ft. 2x6s, and cut one into a 17 ft. 3 in. length and the other into two 6 ft. 7½ in. lengths, squaring up the ends. The long piece is to be used for the rear end sill plate and the two short pieces for the front plates at each side of the door. The main sill plates are now ready, but there are two more short ones for the cellar way cover, as shown on the Section on Plate III. For these take two of the 14 ft. 2x4s and cut a 5 ft. 9 in. length off of each, laying the remaining parts back in the pile. Bevel the end of these 2x4 pieces 3⅝ in. as shown on the Details for same on Plate III.

Now when the walls are all built and the anchors set in same, lay the sill plates approximately in place, mark where the holes for the anchors are to come and bore a hole there, making them large enough so that they will allow for a little play for the plates to be shifted enough to allow them to come in their right place. After all the holes are cut, try the sills until they fit properly and lay properly on the wall so that there will be 2 in. all around the edge on all sides as shown on the Ground Plan, Plate IV. Lift the plate off of the wall and place the nuts and washers where they will be handy. Now spread mortar on the top of that portion of the walls on which the sill plates are to set, spreading it on about ⅜ in. thick or thicker so that the plates can be leveled up properly. Do this on one side at the time, placing the plate in position and force it down into the mortar until it is straight and level and fasten it down with the nut and washer on the projecting end of the anchor bolts. Do the same with the other sides, nailing the sills together solidly at the corners, using 20d nails, getting all square and level. Do not draw the nuts down tight until all the moisture has dried out of the sill plates and the mortar is thoroughly hardened. Do not do any work on top of the sill plates until the mortar is hard, which might take two or three days, according to the weather.

The sill plates for the cellar-way frame are to be placed in the same manner, making them flush and level with the other plates, but leave a half or ¾ of an inch space between the end of these plates and the side of the front end plates, or in other words, let the end of these 5 ft. 9 in. plates that is toward the main building come flush with the outside edge of the door frame, which is to extend out beyond the framing a ½ or ¾ in. This is done so that casings can be placed over the corrugated iron, per the Drawings.

Framing: After the sill plates are all right to work on you can erect the frame, after cutting the dimension stuff up for the various sized members, as shown on the plans and as described herein.

Take two of the 20 ft. 2x6s and cut them down to 19 ft. 8 in. and notch these at both ends the same as you did the side sill plates. These are for the side cap plates. Take two 18 ft. 2x6s and in squaring up the ends cut them down to a length of 17 ft. 3 in. for the front and rear cap plates. Cut thirty 3 ft. lengths out of five 18 ft. 2x6s and cut two more 3 ft. lengths off of the end of a 16 ft. 2x6, making a total of 32 studding. Take the remaining piece of the 16 footer and one more 16 ft. 2x6 and saw off eight 3 ft. ⅜ in. long pieces, for between the studs at the windows. Take the 4 ft. 8 in. piece left from sawing the two short front sill plates and cut it to a length of 4 ft. 4 in. to go in between the studs, over the door. Take one of the 20 ft. 2x4s and cut it to a length of 19 ft. 8 in. and then rip it into two pieces 1⅝x1⅝ for toe pieces on top of the cap plates on each side.

Now nail up this part of the frame work, starting by laying the side cap plate up on the side wall, place a studding under one end and nail it fast, nailing through the 2½ in. notched end of the plate into the end of the stud. Do the same at the other end of the plate and then nail one in the middle, these studs to set with their edges toward the side as shown on the Ground Plan. Now nail a brace at each end, running from the top of the corner stud down to the edge of the end sill plates. Before nailing these braces solid see that the studs are set plumb and square with the sill plate. Put up the other side in the same manner and toe-nail all the studs to the sill plate, making all secure. Now place the end cap plates into position and nail them securely, driving the nails through the side cap plates into the ends of the end plates and through the end plates into the studding. Put up the studs at each side of the door and the additional corner studs and the several studs at the sides of the windows, taking care to get these set according to the measurements on the Ground Plan on Plate IV, and set them plumb and square and nail them fast. Now nail the toe-strips on the outside edge of the side cap plates as shown on Plate III in the Sections and Details. Place the 4 ft. 4 in. piece between the studs, over the door frame in front, nailing it fast, and nail through the studs into the door frame to help hold all secure. Fit the pieces that are to go under the windows in place, but do not nail fast until you get a sash frame ready to set, so you will be sure you get them set correctly.

Take the 7 pieces of 2x6 in. 22 ft. long and cut them into 14 rafters, 10 ft. 6 in. long, over all and bevel them as shown on the Enlarged Detail on Plate III, being careful to get all cuts correct so that the rafters will have full bearings. Now take a 20 ft. 2x6 and cut it to a length of 19 ft. 8 in. for the ridge and pick out seven of the 16 footers for use for ceiling joists and out of scraps of 2x4s and 2x6s lying around, cut eight blocks 11 to 14 in. long to be used for the short uprights to hold up the end ceiling joists as shown on the Sections.

Now take the ridge and nail a piece of board on it to hold up one end and while holding up the other place a pair of the rafters in position, one on each side, the outer sides coming flush with the outside of the frame, and nail them fast, nailing through the rafters into the plates and ridge, taking care so that the end of the ridge is exactly above the outside edge of the plates below, thus bringing the outer face of the rafter flush with the outside of the plates and making the rafters set true and in their proper place, as shown by the Drawings. Put the other end rafters up in the same way and remove the brace and then set the intermediate rafters up in position, placing each one directly over the stud below as shown on the Drawings, and making each square and true, figuratively speaking, and then nail them solid.

Now place the 16 ft. ceiling joists the proper height above the plate as marked on the Sections and nail them to the side of the rafters and then saw off the corner that will project up above the top edge of the rafter. Place the two end ceiling joists so that their outer edges will be flush with the inside edge of the cap plate by using the 11 to 14 in. long blocks. If you have not enough blocks for this, wait with this part of the work until after the cellar frame is cut. Take two of the longest blocks for each end and trim them so they will fit between the rafter and the ceiling joist and rest on the cap plate. Nail through the rafter from the outside into these blocks and through the ceiling joists into the block from the other side, securing all well. Place two of the other blocks between, placing them over the studs as shown on the Sections and nail fast, toe-nailing to the cap plate and nailing through the ceiling joist.

Now take two 20 ft. 2x4s and cut them up into 12 pieces, fitting each one between the rafters in their respective places in the middle of the span of the rafters, as shown on the Sections and nail solidly into place, nailing through the rafters and making the top faces of the 2x4s flush with the sloping upper edge of the rafter as indicated on the Drawings. If the rafters are placed exactly as shown on the Drawings there will be eight pieces 3 ft. ⅜ in. long and four pieces 3 ft. 3 9-16 in. long for this purpose, but to be sure you had better lay the 2x4 in place, mark it and saw it off, then nail fast as you go along, but be careful that you do not spring or bulge the rafters and especially the outside pairs. Take extra care with these so as to keep their outer faces directly above the outer edge of the plates, so as to insure a straight and workmanlike job. Use 10d and 20d nails for nailing up the frame, driving every nail securely home so that the frame will be solid and rigid.

That completes the framing except for the frame for the cellar-way door, which is to be put up after the corrugated iron is in place, but will be described here so you can be ready to place it immediately after the iron is nailed on to the front end. Take the two 8 ft. 2 in. pieces left from cutting the sills for the frame and cut them up into one 6 ft. 8 in. and one 1 ft. 2½ in. piece each. These to be beveled as shown on the Detail on Plate III. The 6 ft. 8 in. piece to be beveled at each end and the short pieces beveled on the top end as indicated by the Detail. Take another stick of 14 ft. 2x4 and cut one length 4 ft. 4 in. to go in between the side frames at the top and two lengths 2 ft. 5 in. for the upright next the wall, and bevel these latter two pieces on the top end as shown on the Detail. After the corrugated iron is in place, nail these 2 ft. 5 in. pieces against it, letting them rest on the plate and be careful to get them plumb and square with the sill plate. Then put the sloping 6 ft. 8 in. pieces in place, nailing through them into the ends of the uprights at the upper end and nailing through them into the beveled end of the sill plates at the lower end. Now put the 1 ft. 2½ in. uprights in place and nail them fast and then take the 4 ft. 4 in. length and fit it between the side frames, fitting it close up to the corrugated iron. The top face is to be flush with and to slope with the top member of the side frame. Nail all securely.

Sash and Sash Frames: The sash to be common 1⅜ in. cellar sash, glazed with 30x16 in. Double or Single Strength Glass (as you desire) divided into three lights as shown by the Drawings, and which are obtainable at any lumber yard or planing mill. If you do not wish to build the sash frames yourself, you can have them made up at a mill, and if you do so, have them make the side and head jambs rebated as shown by the Detail in the upper left hand corner of Plate II. Have the sills made of the same thickness

of material as the jambs with a projecting end as shown on the other Details. The casings to be applied same as described in the following, for the other frames. These frames, of course, will be better than the home-made ones, but also more expensive.

To build these sash frames yourself, proceed as follows: Take four pieces of the 1x8 in. 14 ft. long stuff and dress or plane them down to 7 in. wide, then cut them into eight pieces 2 ft. 10 in. long for the head jambs and 16 pieces 1 ft. 10 in. long for the side jambs. Keep the ends and edges all square and true. Take the two pieces of 1¼ in. stuff and dress up the edges and cut eight lengths 3 ft. 6 in.; by doing this cutting right, quite a bit of material can be saved. Instead of sawing each 3 ft. 6 in. length straight off, saw only half way across the face of the piece and then measure back 4 in. and saw half way across from the other side, and using a chisel, split on the center between these two cuts, making a notch in the end of each piece. Now measure off the 3 ft. 6 in. again, saw half way, measure back 4 in. and cut from the other side and split again, making the long length of each piece 3 ft. 6 in. and the short length between the notches exactly 2 ft. 10 in. Remember that these notched corners are on the same side of each piece. After the eight pieces are all separated go over them again and cut these notches 7 in. deep, leaving only 2 in. or a little over in width for the projection as shown by the Detail "Plan of Ends of Sills" on Plate II. Or, you can saw the full 7 in. depth at the first cutting if you so desire, and have it done. Now place the sill at the slope it is to set as shown on the enlarged Section of the frame and sash and make a vertical saw-cut the 4 in. way in the notch so that when the frame is nailed together and the outside casing is in place, the inner face of this projection will be flush and on a line with the inner side of the casing. Now bevel the outside and inside edges of the sill, using a plane so they will also be plumb and vertical when the sill is in place as shown by the Detail. It would be a good idea to cut a small V or other shaped channel or groove on the under side of the sill near the front edge to form a drip for the water. This groove to run the entire length of the sill and can be made with a chisel, gauge or a rebate plane. It is indicated on the Details.

Now nail these eight frames together, placing the head jambs between the side jambs and nail well in place. The upper ends of the side jambs being flush with the top side of the head jambs. Nail the sills in place between the side jambs, making the distance from the head jamb to the sill at the front edge of the jamb 1 ft. 8 in. the outside size of the sash as shown and marked on the Detail and slope the sill as shown. Square the frames up and put a diagonal strip on the inside of the frame, to hold them square and true. Use 8 d. nails for nailing up these frames, except as otherwise mentioned. 6 d. nails may be all right in some places.

Now take one of the frames and set in place between the studs at the height shown on the Details and lift the 2x6 that is to go between the studding up under the frame so it will rest on the 2x6 and then nail it solid, nailing through the studding into the end of the 2x6. Set the other 3 ft. ⅜ in. cross 2x6s at the same height, lining them all up carefully so that all the windows will be exactly on the same level and nail them fast. Now set the frames in place, letting them rest on the cross 2x6s and move them until they project about ⅞ in. on the outside and not over ¾ in. on the inside, and then nail them fast, nailing through the jambs into the studding. Place the nails in such a position so that the stops will cover them, which will be about 1½ or 1⅝ in. from the edge of the jamb. In nailing the frames fast be careful that you do not spring the jambs or knock them out of true in any other way. Instead of using the measurements given above for the projection of the jambs on each side of the studs, it would be a good idea to measure the height of the corrugations of the different sized corrugated iron and then proportion the projections accordingly, so as to make the best and neatest appearing job.

The frames are now set in their proper places and now the stops can be nailed in place. Take a 1x6 in. board and rip it into ten strips ½ inch wide to be dressed down to about ⅜ in. Cut these strips up into four 2 ft. 9¼ in. lengths and four 1 ft. 8 in. lengths for each frame. Nail these in place 1⅜ in. back from the edge of the jambs, as shown by the Details, using 3 d. nails or smaller, just so they are long enough to hold the stops. Fit in the side stops first and then the top and bottom stops. The two stops that go on the bottom on the sills are to be beveled on the bottom side so the edges will be perfectly vertical when they are placed, as shown on the Detail. If you wish you can fit the sash now or wait until the casings are all on, but you had better leave the sash until all the hammering and pounding around the windows is done, so as not to have any glass smashed.

The corrugated sheet iron is to be applied before any further work is done to the windows. Same to be put on as described under its proper heading, but to keep all about the windows under one heading, the following paragraphs will take up the work as it is to be done after the iron is on as above stated.

The corrugated iron on, the casings can be secured in place, giving a finish to the building. For the casings take five of the 1x8 in. 14 ft. boards and rip them into ten strips about 3⅝ in. wide each. Take these ten 3⅝ in. strips and dress them down to 3½ in. wide, taking off all the rough edges. Take six of these strips and cut twenty-four lengths 3 ft. 5½ in. long off of them. Eight of these are to be used for the outside head casings and the other sixteen for the inside casings. Take the other four pieces and cut 16 lengths 1 ft. 8¼ in. long for outside casings and 16 lengths 1 ft. 7¾ in. long for inside side casings. It will not hurt to cut these latter two lengths a trifle long so they can be fitted in place.

Now hammer the corrugated iron down so that the highest projections or corrugations will come flush with the outside and inside edges of the jamb and this to extend to a distance of 3 inches from the outside of the jambs, making it possible to put on the casings square and straight so they will not slope outward from the jambs, or if you do not have good success at pounding the corrugations flat, cut the casings out at the back for the projecting corrugations so the casings will be straight. The first method, of course, being the best. This hammering or fitting will have to be done only on the sides and across the top on the outside, for the corrugated iron is to butt up tight to the bottom of the sill. On the inside the corrugations will have to be hammered down all around the frame, for the openings are cased all sides.

Now nail the eight outside head casings to the head jambs, setting them up ¼ of an inch from the under face of the head jamb, as is shown on the Drawings, and be sure that you have exactly the same projection over each side. After these are nailed in place, fit the side casings in place, taking care so they fit tightly to the head casings and sills and nail these fast so that they will set ¼ in. back from the inside face of the jambs, and see that the outside edge of the side casing is flush with the end of the head casings, and that everything is true and straight. Toe-nail the head to the side and the side to the sill from the edge, using one nail for each.

Nail the inside casings on in the same manner except that here the openings are cased all around as shown on the Sections. Nail in place the top and bottom casings, taking the same care with these as with the outside casings. Fit the side casings in place and nail and toe-nail as described for the outside casings, and do all the work in a workmanlike manner, leaving all the casings straight and true and well fitted.

The casings in place and securely nailed, you can fit the sash and hinge them as shown on the Detail. The outside sash is to set with the putty side out and hinged at the top as shown, using two of the 3x3 in. hinges provided for this purpose. Plane off the edges, cutting off the projecting ends of the stiles and rails if that is not already done, and fit them into place, beveling the bottom rails so that they will fit snugly to the sills. Chisel out the top rail of the sash and the head jamb to receive the hinges and screw them fast to the sash first, taking care that they are perfectly straight and square, then screw them fast to the head jamb, driving the screws in straight so that the heads will be flush with the plate of the hinge. Drop the sash down and plane it off a little if it does not fit just rigt, though it should if the first fitting was done right and the hanging was done in a workmanlike manner.

The inside sash is to be hinged at the bottom and will take a little more planing and fitting, especially the long way of the sash. The bottom rail is to be beveled to fit the slope of the sill and the sash is to set with the putty side turned toward the outside sash, so that when the sash is open the glass will rest on the wood instead of on the putty. Chisel out for the two 3x3 in. hinges on the bottom rail of the sash and on the sill and secure the hinges on the sash first and then on the sill, taking care to get them straight and square and to get them set so that when the sash is closed it will have a full bearing all around on the stops, and so that the face of the sash will be flush with the edge of the jamb as shown on the detail.

The sash locks or fasteners can be put on now, or you can watt until the sash are painted and put them on then. If you provided two fasteners for each sash, place one near each end at the sides, and if you have only provided one, place it in the center on the bottom or top rail, according to which sash same is put on. One will be all right if you get the right kind of a fastener or sash lock. The hardware man can assist you in the selection of the fasteners. Provide chains or cords or other adjustment for holding the sash open, or a common stick will do the work when the weather is agreeable and not too windy.

Paper and Corrugated Sheet Iron: The paper is to be heavy asbestos paper and the corrugated sheet iron can be either galvanized or the painted iron, to suit yourself and your pocket book. The galvanized sheet iron is, of course, the best and the kind recommended. Use 22 guage 2½ in. corrugated iron for the exterior and 28 guage 1¼ in. corrugated iron for the interior.

After all of the main framing is up, and the sash frames are up, cover the framing with a layer of the asbestos paper, lapping it well at the joints and securely tacking it with the 3 oz. tacks provided. The outside of the frame is to be covered with this and the interior is also to have a layer of it, and it is to be put on in the same manner as ordinary building paper, stretching it from one stud or rafter to the other and tacking securely and handle it carefully so that you do not get it full of tears and holes. This paper is to come close to the window and door frames and is to turn and project out at least a half an inch beyond the edge of the jamb, this latter to be turned back over the corrugated iron under the casing, so as to make as moisture proof a job as possible.

After the paper is all on, or after it is on a part of the building, cover the building or the part with the corrugated iron, the 2½ in. going on the exterior and the 1¼ in. on the interior as stated in the above. Watch the Elevations carefully on Plates I and II while doing this work.

Commence on the sides using the 7 ft. 2½ in. corrugated sheet iron, force it down on the mortar at the bottom of the sill and mark it at the top of the cap plate and cut it off, using a tinner's shears or snippers. Cut as much as necessary to go around the building, fitting and securing it as you go along, the top of the metal to come a little below the top of the cap plate, and to set as close to the top of the masonry wall as it is possible to force it. Fit it very close to the sash or window frames and over the front door frame, so as to make a tight job and if you find it practical you can flatten the corrugations a distance of 3 in. from the edges around the side and top for the casings as described under "Sash and Sash Frames" before securing in place, doing away with all the hammering after it is in place. But do this only if you find that it does not spread or bulge the iron, or have some other disconcerting effect. In securing, drive a nail through every other corrugation along the top and bottom and don't forget to lap it at the joints, at least one lap as shown on the Detail, although two would be better, but may use up too much material. At the corners allow enough lap so that you can bend the iron around the corner and make a good, tight joint. Use your good judgment in cutting the material and use every piece big and little when it is possible. In nailing the top edges of the pieces that go across the end, both front and back, drive only one nail, just sufficient to hold them in place, for when the gable pieces are put on, you can nail through both of them, using only one nail, whereas if you nailed the first sheet solid, you would use two, and that much extra work expended, but nail the bottom securely, the same as on the sides.

When you have this 3 ft. 4 in. height all covered all around the building, you can place the outside casings for the sash frames on the jambs, so that the overhang of the eaves, when the roof is put on later, will not form an obstruction and make it that much harder to work, thus saving time and labor and insuring a better job. Proceed with this work as stated under "Sash and Sash Frames." When putting on the casings turn the asbestos paper up, being careful not to tear same, so that it will form a protection against water for the sash frames.

The casings on, put the gable pieces up, using some of the 6 ft. lengths and cutting them as indicated on the End Elevations, Plate II, so as to use up every piece of material. Nail these the same as described above for the other pieces.

Now erect the cellar-way frame as described under "Framing," and make it secure ready to be covered with the corrugated iron, as shown on the Elevations, using up otherwise waste pieces.

Put on the roof, using the 6 ft. lengths. Put on the lower course or sheets

first, nailing them fast at the bottom, driving a nail in every other corrugation and driving these through the highest point of the corrugation, and lap each piece at least one lap as shown by the Detail on Plate I, although two would of course be better, as stated above in referring to the walls. Lay the top sheets or course next and nail it at the top and at the bottom, nailing through the bottom part of the upper sheet and through the top part of the lower sheet, thus holding both. If you can get the corrugated iron in 12 ft. lengths, you can use this in preference to the 6 ft. sheets. Nail all securely so that the wind will not blow the sheet iron off the roof. Let it project over the sides and ends to form eaves as shown on the Drawings. Be careful in handling the iron so as not to punch any holes through the asbestos paper. Make a couple of strips of the corrugated iron for the ridge as shown on the Elevation and nail fast, and be sure and get lap enough so the wind will not blow the snow and rain under same and inside, through the corrugations along the ridge.

Be sure that the corrugated iron is on solidly and be careful while laying it that you do not get a patched up effect and take care at the joints and in nailing so that all will be weather and water proof. Use 4 d. galvanized roofing nails with washers for nailing the iron on, or other size and kind as may be recommended by the people from whom you secure the iron. If you do not use the galvanized metal be sure and paint each sheet on the under side and such portions of it as will be covered in making joints, etc., before it is applied. This will make the metal last very much longer.

The interior is to be covered with asbestos paper, the same as the exterior, and then commencing at the top of the wall on one side, secure the 1¼ in. corrugated iron, using such sheets as will work to the best advantage and continue laying it over the ceiling and down the other side, fitting it well around the window frames. Then cover the ends, fitting it nicely around the windows and door-frame and taking care with it up in the corner, where it will have to be curved so as to fit close to the other sheet iron that forms the coves at the junction of the ceiling with the walls. Be sure and get this done in a workmanlike manner and take care in handling the iron so that you do not punch holes in the paper. Use 4 d. nails or the same as you used on the exterior, and drive them in every 4th or 5th corrugation, driving them well home so as to make a good substantial job.

After this interior corrugated iron is on, put on the casings around the window openings as described under "Sash and Sash Frames" and after these are on, you can call the interior done, except for painting and the hanging of the doors and sash, which is described elsewhere under the proper headings.

Door and Stairway Cover: The building is all inclosed except for the door and the cellar-way top, as it is called on the Details on Plate IV.

The door is detailed on Plate I and is shown on the Ground Plan, Front Elevation, and Section on line B-B. Take five pieces of the 14 ft. 1x6 in. flooring and cut it up into ten pieces 6 ft. 6 in. long, or in case this measurement may vary a little, measure from the concrete step up to the head jamb of the door and use that measurement instead, if it is different. Take a piece of the 1x6 in. stuff and cut three battens out of it, each 4 ft. long. Lay the pieces of flooring together, driving them close up to each other, keeping the ends square and even and then place the battens equal distances apart on the back and nail them fast. Nail solidly so that the door will have no tendency to sag. There are possibly some strips left by this time, but if not, take some other ⅞ in. board that is not intended for another purpose, cut two lengths 6 ft. 6½ in. and one length 4 ft. 10½ in. for stops. These stops to be at least 2 in. wide, and are to be fitted and nailed solidly on the jambs, both side and head, of the door frame, placing them about 1⅝ in. back from the inside edge of the frame as shown by the Detail.

Now fit the door, dressing it down on all edges, so that there will be room for the tin with which it is to be covered, and which is to be turned over the edge and nailed there. Now cut the two 8x8 in. openings for ventilating openings in the door, and prepare a piece of tin or a piece of corrugated iron that you have pounded out flat, for the sliding doors over the openings, shape them as shown on the Detail and curl the upper edge over to form a handle and stiffener as shown. Take some strips which can be pieces off of laths or any strips even thinner and prepare them by cutting them to proper lengths as marked on the Detail and cutting a small rebate in the edge for the tin or galvanized iron sliding door. This rebate can be made with a chisel and ought to be tight so as to hold the slides tightly against the flooring of the door when pushed down to a closed position. These strips can be nailed in place, but remove the slides after seeing that they work all right.

Now lay the door on its face, take the soldered up sheet of tin you have provided and hammer it down, shaping it over the battens so it will fit tightly over same. And also make a neat appearing job. Do not let the tin between the battens fit close to the corner, but allow a little space for expansion and shrinking. The detail makes and attempts to show how the tin should slightly slope so as to give play-room for the motion back and forth of the tin, which might be caused by changes in temperature of the room. After the tin has been formed over the battens turn it over the top and bottom edge and nail it fast, using shingle or 3 d. nails, or get some broad-headed slaters' nails which will be better. Now turn the edges over the sides and cut off properly and nail solid, same as at the end. You will have to do some cutting at the battens to make a good job. Punch a hole in each 8x8 opening in the door and cut these open and turn the edges in and nail fast as shown by the Detail.

After the tin is all on solid and secure the door is ready to be hinged in place, so take the three tee hinges provided and put them in place one on each batten as indicated on the Detail, and chisel out some of the frame for the tee of the hinge, which will project under the stop. Drive the screws in solidly through the tin on the door. In placing the hinge be careful that they are true and on a line, so they will not bind or get wrenched off the first time the door is opened. Put on the latch or strap or whatever you have provided for locking the door up and all that is needed to complete the door is to slide in the metal sliding doors and give the whole door some paint. The tin ought to be painted on the under side before it is put on.

If you desire you can cover the projecting parts of the door jambs with tin and thus reduce the fire risk that much more.

Take a 1x6 and rip it into two 2 in. strips, part of which may be used for the stops above. Cut two lengths 6 ft. 6½ in. and one length 4 ft. 4 in. These to serve as casings for the door frame. If the corrugated iron isn't already hammered down do so now, and fit these 2 in. pieces in place and nail them fast, doing all in a workmanlike manner, per the Drawings.

The frames at each side of the cellar-way are covered with corrugated iron, which should follow the slope very closely, coming up on a line with the top of the sloping 2x4s. For the two doors, take six pieces of the 1x6 in. 14 ft. boards and cut it in proper lengths to reach from the first step or tread to the cross 2x4 and extending over it about an inch, as shown on the Section taken on line B-B. This distance is marked 6 ft. 4 in. on the Drawings, but check it by measuring the work. Take a 1x6 and cut six lengths 2 ft. 1½ in. for the battens. Take another 1x6 and trim it down to about 4½ in. wide and then cut it into two pieces which are to be placed at the side of the doors up the slope and get another piece of board that you can cut a ⅞ in. by 5 or 5½ in. by 4 ft. 6 in. long piece, to be used at the top of the doors. Now fit these latter pieces in place, placing them so that they will set back about 1 in. all around from the inner side of the 2x4s forming the frame to make a rebate for the doors. The side pieces, about 6 ft. 10 in. long, are to extend out over the corrugated iron, setting 1 in. back from the inner edge of the sloping 2x4s as above stated, and the upper ends are to be cut so they will fit into the corrugations of the iron on the wall. The lower ends can be straight and square and are to line up with the bottom edge of the doors. The 4 ft. 6 in. piece across the stop is to set about 1 in. back from the edge of the cross 2x4 and is to be corrugated on the back edge to fit the corrugations of the sheet iron, and do this in a workmanlike manner, so it will be a good piece of work.

After these pieces are nailed on, nail up the doors, making them 2 ft. 3 in. wide and 6 ft. 4 in., or whatever the other measurements is, in length. Lay sufficient pieces of the flooring together to get the proper width for the doors and nail the battens on the back on the under side of the doors. And then size the doors down so that they will fit in place. Put on the tee hinges, three to each door, and place in position the handle so one door can be pulled up and place the batten or strip over the joint, nailing it fast to the door with the handle on, so that in lifting it first it will not obstruct as it would if it were nailed onto the other door. This strip to be the same length as the door. All this work to be done in a workmanlike manner, and according to the Drawings and Details on Plates II, III and IV.

After this is all completed the building is ready to be painted inside and out.

Painting: The woodwork should all be painted as soon as it is all in position and thoroughly dry, and in applying the paint, it is desirable to brush it on with the grain of the wood.

The tinwork should all be painted on the under side before it is put on as before stated, and painted on the exposed side at the same time as the woodwork. The corrugated sheet iron, if it is not galvanized, should be painted the same as the tinwork, painting the under side before application and painting on the outside as quick as the building is ready for it and all the surfaces cleaned.

If you have used the galvanized corrugated sheet iron, which is the best, do not paint it at once, but let it stand for several days so that any grease that may be upon it will have time to come off, and so that the galvanizing will be slightly oxodized or rusted by the air, and then clean it off with a stiff brush and paint it thoroughly. In this way you will have no trouble in getting common paint to stick. If you wish to paint it at once, scrub it thoroughly and let it dry before applying the paint.

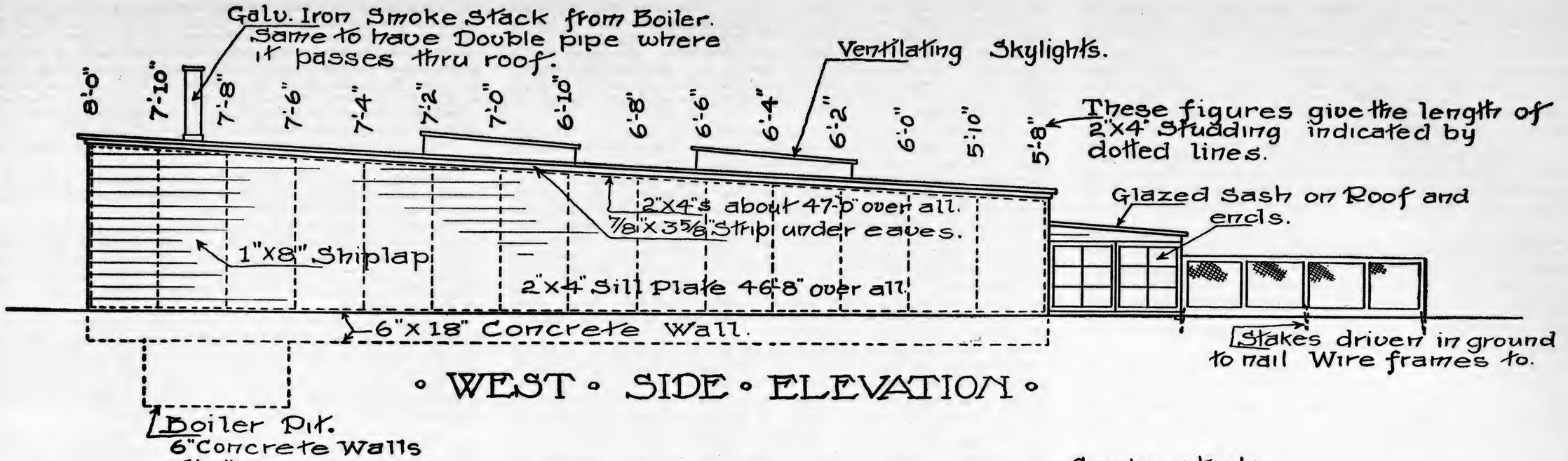
You can use ready mixed paint or you can mix your own paint as you wish. For mixing your own paint use paste white lead and pure boiled linseed oil, and if you are in a hurry for it to dry, add some drier or a little turpentine. A little zinc white, using one part zinc white to two or three parts white lead makes a better paint than white lead alone, but either way it will give good results. To color the paint, which ought to be used on the interior of this cellar, add colored pigments to the lead or lead and zinc, choosing colors to suit your taste. A dark gray or a bluish or greenish gray or something on that order being suitable tints. The exterior is to be white or tinted to match the other buildings on your farm.

All parts should have two coats at least of paint, leaving about a week between each successive coat, to give it ample time to dry.

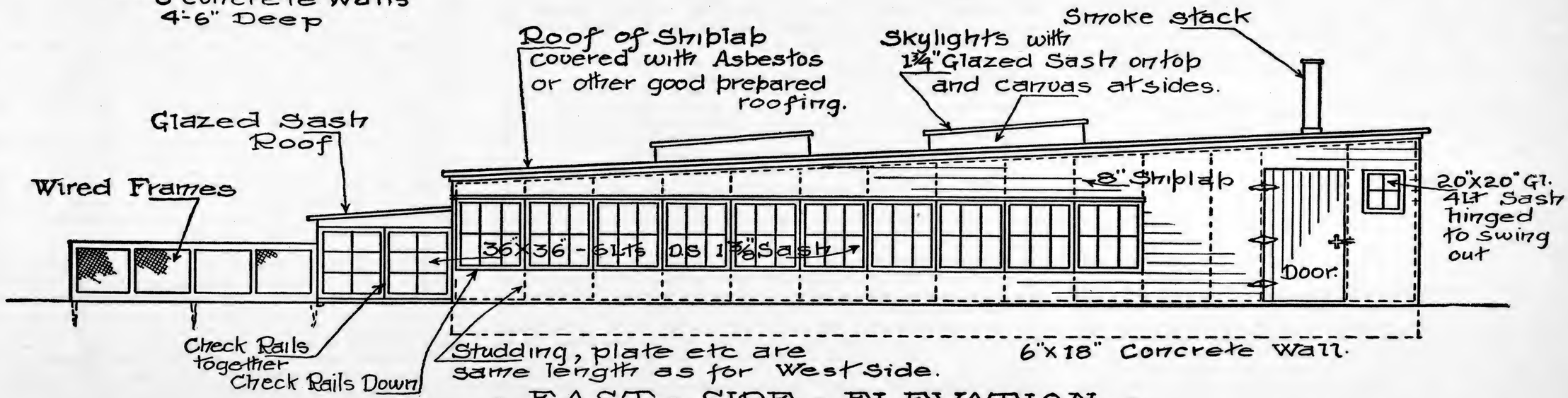
Paint all parts of the windows and doors and doorways inside and out and paint the outside and inside of the iron as stated above, brushing the priming coat on thoroughly, so as to leave no bubbles or thick places to blister and peel off. The priming coat for the woodwork may be thinned, but it should not be thinned for the iron work.

Finish: After the several coats of paint are dry on the exterior, fill the remaining earth that is piled around the building up against the walls to the height and as shown on the Elevation and Sections on Plates I, II and III, packing it solid letting it slope away from the building as shown, and sow grass on it so that it will present a nice appearance when all done. If the vent stack has not been built up by this time, do so now, mixing up enough mortar to do the cementing around the joints. On account of this mortar it will be better to build it up while you are using mortar and protect it as stated in previous paragraphs. If necessary, put up a couple stay wires of common hay-baling wire from the building to the tile stack and paint the wire so that it will not rust out, and the outside work is done.

Now clean the interior, of all rubbish and other dirt, open the windows and doors, if you have not already done so, to let it dry out thoroughly. Set in the incubators with a small work table in the center of the room. Block up the legs of the incubators so that they will set properly and proceed with the hatching of chicks that will have lots of healthy brothers and sisters, regardless of whether they have or have not a mother, depending on the correct answer of the question "Which is the Mother of the Chicks—the hen that laid the eggs or the hen that hatched them."



• WEST • SIDE • ELEVATION •



• EAST • SIDE • ELEVATION •

KELLERSTRASS PLAN OF
BROODER HOUSE
AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale. 0ft 1ft 6ft

PLATE·I·

BROODER HOUSE

BILL OF MATERIALS.

Concrete Walls—Foundation and Boiler Pit:
240 cu. ft. of Concrete mixed 1—3—6.
This will be enough cement and sand for top coating.
8½ bbls. Portland Cement.
4½ cu. yds. Clean Sharp Sand.
9 cu. yds. Broken Stone or Gravel.

Steel Pipe Columns:
8 2 in. Pipe Columns with flanges screwed on top and bottom.
Length as follows:
2 columns 5 ft. 9½ in.
2 columns 6 ft. 3¼ in.
2 columns 6 ft. 8¾ in.
2 columns 7 ft. 2½ in.
Total of 53 lineal ft. pipe, 16 heavy flanges.

Drain Pipe:
Enough 1½ in. galvanized iron pipe with couplings to reach from boiler pit to a low place in your grounds or 25 or 30 ft. for the other methods described later. If these pipes are to turn, get necessary elbows.

Anchors:
20 ½x10 in. Anchor Bolts with nuts and two large washers for each bolt.

Roofing:
1400 sq. ft. or 14 squares Asbestos or other good brand of Ready Roofing, with roofing nails and cement.

Glazed Sash:
22 36x36 in. D. S. Glass, divided 6 lights, 1⅜ in. thick.
1 20x20 in. D. S. Glass, divided 4 lights, 1⅜ in. thick.
4 Skylight Sash, 5x8 ft., Outside measure, 1¾ in. thick.
8 Skylight Sash, 3 ft. 4 in. x 7 ft., Outside measure, 1¾ in. thick.
The muntons and glass to run lengthwise in these skylight sash as shown by the Drawings. Glass to be D. S.

Lumber:

Dimension:
1335 sq. ft. B. M. 2x4s, 14 ft. lengths for framing, 143 pieces.
324 sq. ft. B. M. 2x6s, 18 ft. lengths for girders, 18 pieces.

Shiplap:
1500 sq. ft. B. M. 1x8 in. shiplap, 10 or 20 ft. lengths, roof.
1200 sq. ft. B. M. 1x8 in. shiplap, 10 or 20 ft. lengths, walls.

2700 sq. ft. Total.
If you wish, get 1500 sq. ft. of No. 1 Sheathing boards, instead of the shiplap for the roof.

No. 1 Fence Flooring—for Doors and Removable Floors:
198 sq. ft. 1x6 in. flooring, 12 ft. lengths, 33 pieces.

No. 1 Sheathing Boards:

184 sq. ft.	1x4 in. stuff,	12 ft. lengths,	46 pieces.
102 sq. ft.	1x4 in. stuff,	14 ft. lengths,	22 pieces.
11 sq. ft.	1x4 in. stuff,	16 ft. lengths,	2 pieces.
64 sq. ft.	1x6 in. stuff,	12 ft. lengths,	9 pieces.
217 sq. ft.	1x6 in. stuff,	14 ft. lengths,	31 pieces.
20 sq. ft.	1x6 in. stuff,	20 ft. lengths,	2 pieces.
120 sq. ft.	1x8 in. stuff,	12 ft. lengths,	15 pieces.
131 sq. ft.	1x8 in. stuff,	14 ft. lengths,	14 pieces.
27 sq. ft.	1x8 in. stuff,	20 ft. lengths,	2 pieces.
33 sq. ft.	1x10 in. stuff,	20 ft. lengths,	2 pieces.
56 sq. ft.	1x12 in. stuff,	14 ft. lengths,	4 pieces.
384 sq. ft.	1x12 in. stuff,	16 ft. lengths,	24 pieces.
80 sq. ft.	1x12 in. stuff,	20 ft. lengths,	4 pieces.
1429 sq. ft.	Total B. M.		177 pieces.

Order these last four 20 ft. 1x12s about ¾ in. extra long, if possible to get them so, or get 10 footers that are extra long.

Drip Mold:
64 lineal ft. about 1⅛ in. projection.

Laths: About a half bundle.

Heavy Felt:
70 lin. ft., 24 in. wide, for brooders on floor.
26 lin. ft., 18 in. wide, for hovers across front, or this may be 13 lin. ft., 36 in. wide.

Light Weight Canvas:
50 lin. ft., 24 in. wide, about 8 oz., for brooders.
52 lin. ft., 36 in. wide, about 8 oz., for ventilators.

Poultry Wire:
110 lin. ft. 1 in. mesh, galv. wire, 20 or 24 in. wide, for brooders.
130 lin. ft. 1 in. mesh, galv. wire, 30 in. wide, for run-way frames.
44 lin. ft. 1 in. mesh. galv. wire, 36 in. wide, for frames.
28 lin. ft. 1 in. mesh. galv. wire, 48 in. wide, for frames.
30 lin. ft. 1 in. mesh, galv. wire, 60 in. wide, for frames.

Cord: This may be heavy common chalk line or other braided cord.
100 lin. ft. for sliding doors of brooder runs across front.

Fly Screen:
2 sq. ft., for front hovers.

Hardware:
6 16 in. strap hinges for doors.
2 Barn door latches or handles or common hasps. If you wish you can make latches out of wood, so you will not need to buy them.
18 3x3 in. hinges for front wire frames.
56 2x2 in. hinges for brooder hovers.
68 metal or porcelain knobs for hover doors and frames, or these may be medium large sized eyelets.
8 medium sized pulleys, for cord, per Drawings.
8 medium sized eyelets for same.
16 10 in. hooks and eyelets for frames and in ceiling.
1 wire hook and eyes for Entry Sash.

Screws:
120 2¼ in. screws for 1⅜ sash.
80 2½ in. screws for 1¾ sash.

Nails:
5 lbs. 20 penny (d) common, for framing.
12 lbs. 10 penny common for framing.
50 lbs. 8 penny common, for shiplap.
5 lbs. 6 penny common, for frames and mold.
8 lbs. 20 penny finish, for wire frame.
3 lbs. 3 penny fine, for stops in brooders, etc.
3 oz. 3 oz. tacks, for canvas on skylight.
2 oz. 2 oz. tacks, for brooders.
2500 small staples, for poultry wire.

Paint:
6 gals. Ready Mixed Paint for two-coat work. If only one coat is desired, four gallons will be ample.
It will take about 90 or 100 lbs. White Lead and 4½ gals. pure boiled linseed oil to mix the above quantity, if you desire to do the mixing yourself. Some Dryer or a little Turpentine will also come in handy.
If you wish a Zinc White and White Lead Paint, get about 65 lbs. of White Lead and 25 lbs. Zinc White with the same amount of oil, as above.
Get about two-thirds of the above material for one-coat work.
A bushel of Lime for whitewash.
1 gallon of Creosote or Crude Carbolic Acid.

The quantities of materials for the heating will be given later in the paragraphs under "Heating."

HOW TO PROCEED WITH THE WORK.

Grounds: Select a level piece of ground that is at least 28x66 ft. for this Brooder House, with the long way running north and south so that the run-ways can be built on the south end of the lot as shown on the Ground Plan on Plate III. The directions are shown on the Plate. Choose a piece of ground that is situated in a dry place so that the floor of the Brooder House will not be continually wet and moist.

Leveling: If your ground lies level, remove the grass and weeds and other rubbish and tamp any loose spots, and cut away any small mounds until it is perfectly flat and then proceed to lay out your building as described under "Laying Out."

But, if your grounds are not level, and are rolling, pick out a slope that faces the south more or less, and that can be easily leveled up and then proceed and level it by removing some of the earth on the high side and filling in on the low side. Tamp all this loose earth down solidly, and if possible let it stand until it is thoroughly settled by rains, for loose, filled-in earth is not very good to build on, and it is impractical and well nigh impossible to tamp it so solid that it will not settle more than the solid earth around it.

A good scheme would be to cut the excavation, that is cut the high side low enough so that the 18 in. high concrete foundation wall will in all places go down about 6 in. into the solid earth if not entirely into it. This would mean to cut the excavation in the hill side 28 ft. wide by 37 ft. to 47 ft. deep, or 66 ft. long by 18 to 28 ft. deep, depending on which way the building is to face, as compared with the direction of the slope of the hill side. At any rate, if possible, do this moving of the earth or leveling in such a way that the foundation for the main building, which is about 28x47 ft., will rest on solid ground, so that the earth will not settle and in so doing, carry a part of the foundation with it, cracking it and making it unlevel on top, thus making your building lopsided instead of square and straight as it should be. The open and covered runs may be built on filled earth, for they can easily be straightened up when the ground settles down.

Level the plot up so that it will be perfectly flat and tamp all the loose earth down solidly.

Laying Out: After your plot of ground is leveled and all tamped solid, lay out your main building or foundation walls and piers. Use a tape measure for running all the long measurements with.

Across the north end of the plot stretch a cord or line parallel with the edge of the level piece of ground, and fasten to a stake at each end, the stakes are to be driven about a foot outside of the future wall line on each side, making them about 29 ft. apart. About a foot to the rear or northward from this line and about a foot inside of the outer stake, drive another stake and then stretch a line, along one side of the grounds from this stake, to a stake driven about 48 ft. away. Be sure and get this line at right angles with the first line stretched. If the stakes are driven correctly, the lines will cross about 12 in. from the stake and this crossing, marks the corner of the foundation.

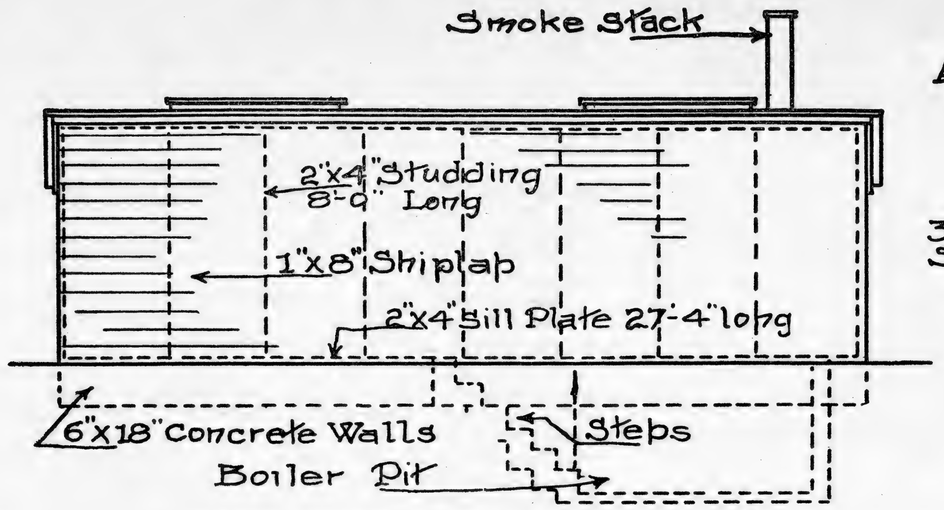
To prove that the corner is square, measure along one line 6 ft. and along the other 8 ft., measuring from the corner and the diagonal measuring across from the 8 ft. point to the 6 ft. point or vice versa, will be 10 ft. exactly. Or, if you measure out 10 ft. each way from the corner, the diagonal will be 14 ft. 1 11-16 in., as near as practical. If you find that the corner is not square, shift the handiest stake until you have an absolutely square corner.

These two lines mark one side and the rear of the building, and now set the lines for the front and other side. Measure off a distance of 27 ft. 6 in. on the rear line, measuring from the corner and at this point about a foot back of the rear line, drive another stake and stretch the other side line from this last stake to another driven even with the other front stake. Square this corner up the same as you did the other, making the side lines absolutely parallel and keeping them 27 ft. 6 in. apart. Now from the crossing of the lines on each side, measure off a distance of 46 ft. 10 in., the length of the side foundation wall, and stretch a line across at this point, securing it to stakes driven about a foot outside of the side lines. Try these last corners so that you will be sure they are square and then measure both the ends and the sides so you will be sure that the size is correct, which is 27 ft. 6 in. by 46 ft. 10 in. These lines do not need to be high up off the ground, but only sufficient so they can de stretched tightly, so that they will be absolutely straight.

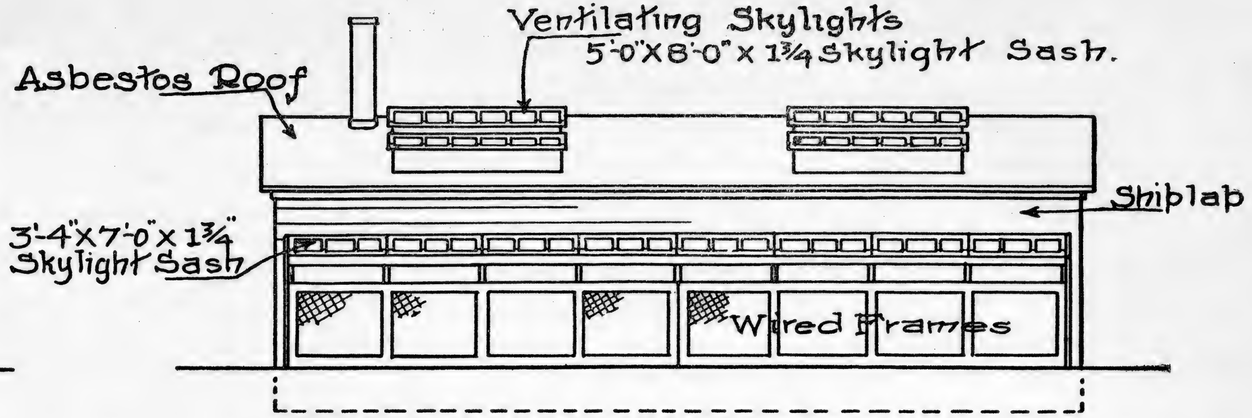
You have now got the outside walls of the foundation laid out, and you can commence digging the trenches for same as described under "Excavation" or proceed with the laying out of the foundations or footings for the columns, and the boiler pit as shown on the Ground Plan, Plate III.

Measure off on each of the side lines a distance of 9 ft. 5 in. and stretch a line across from one to the other, and on this cross line, measure out a distance of 10 ft. 5 in. from each side line, and at these two points drive a stake. These two stakes mark the center of the footings for the first pair of columns. From the center of one stake to the center of the other, should be a distance of 6 ft. 8 in. as marked on the Ground Plan, and the distance from the closest end wall should be 9 ft. 5 in. If the measurements are not these, make them so. Now shift the cross line 9 ft. 4 in. toward the farther end wall and drive two more stakes 10 ft. 5 in. in from each side line, making them 6 ft. 8 in. from center to center and 9 ft. 4 in. from their centers to the center of the other two stakes. Drive two more pairs or four more stakes in the same manner and see that the distance from the center of the last pair to the outside end wall line is 9 ft. 5 in.

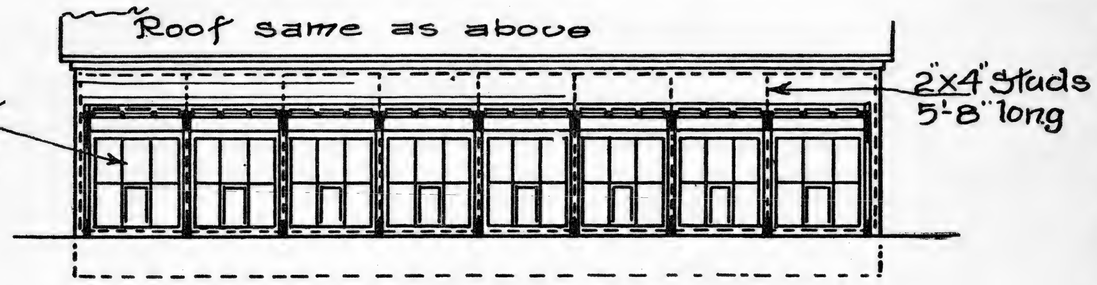
You now have the centers of all the footings for the columns and around



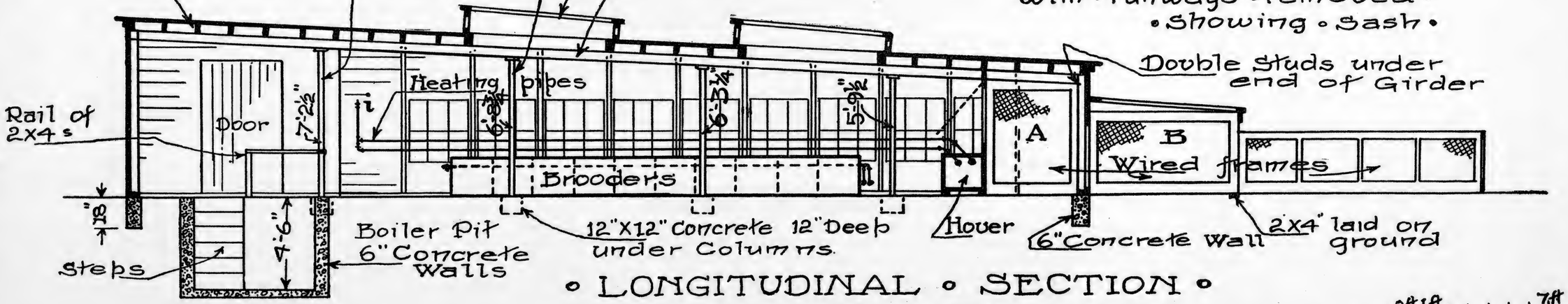
• NORTH • ELEVATION •



• SOUTH • ELEVATION •



• SOUTH • ELEVATION •
with • runways • removed •
• Showing • Sash •



• LONGITUDINAL • SECTION •

KELLERSTRASS PLAN OF

BROODER HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale off 1ft 7ft

PLATE • II •

these stakes measure out a distance of 6 in. each way and mark off a 12 in. by 12 in. square, the size of the column footings. Be sure and get the stakes in the center all on a line, both crosswise and lengthwise, so the footings will all line up.

You have perhaps noticed that the measurements herein given from the center of the column or footings to the outside wall lines are 1 in. greater than those given on the Ground Plans. The reason for this is that the Ground Plans give the measurements for the framing above the foundation and the foundation wall is to project 1 in. beyond the wood framing, making the foundation 1 in. larger all around, as indicated in laying out the main walls at the start, for the measurements herein stated for the main walls are 2 in. longer each way than those given on the Ground Plan.

Now mark off the lines for the boiler pit. These can be made by pushing a spade into the ground, making a deep well defined mark, and be careful to get all the lines straight and parallel with the other lines, so that all the work will be square. Commencing at the innermost corner, lay it out so that the column will rest on the 6 in. concrete retaining wall that is to be built as shown on the Ground Plan; that means to measure out 3 in. from the center of the stake toward the front and 3 in. toward the farther side wall line, then with this corner established, measure back toward the closer side wall line, a distance of 9 ft. and back toward the rear wall line, a distance of 7 ft., which will give you the size of the pit to be excavated. Mark this off as above stated, keeping all corners square, and then mark off the space for the stairs in front, as shown on the Plans, which will project from the front line of the pit 4 ft. and be 3 ft. 6 in. wide, all as shown on the Ground Plan on Plate III.

If you wish, mark off the distances for a foundation wall or pier under the partitions which form the Entry, but this is not at all necessary, for this partition can rest on loose bricks or stones, for they are not carrying partitions, serving only to separate the Entry from the other parts of the Brooder House. If you do not wish to put in a solid foundation make the measurements 7 ft. 2 in. and 10 ft. 2 in. instead of the even 7 and 10 ft. as marked on the Plans.

That finishes all the laying out. The run-ways do not need to be laid out in this manner, for they will come straight of themselves, if the main part of the building is straight and square.

Excavating: The laying out all done, proceed to dig the trenches for the foundation walls and the holes for the column footings and excavate for the boiler pit, as indicated on the Plans and Sections.

The trenches for the foundation walls are to be 6 in. wide and 18 in. deep, as shown on the Drawings and are to be dug with the outside edge immediately under the outside wall lines that are stretched between the stakes, and the inside edges 6 in. in from the lines, but running parallel with them. Make these trenches straight and true with the sides straight and vertical. These trenches can easily be dug if the ground is hard and solid and by using a narrow spade. If the ground is solid and holds up well, you will not need any forms for the concrete and save that much expense and time by pouring the concrete directly between the earth banks of the trench with only a couple of boards at the top as described later under "Forms For Concrete."

But if the ground or soil is soft or sandy and has a tendency to fall back into the trench as fast as you spade it out, you will have to proceed differently than described above. Dig the trench large enough, sloping the sides if necessary, to build forms for the concrete. The trenches thus enlarged will, of course, extend out on the outside of the lines so that the forms can be placed properly, but keep the sides parallel with the lines. Pile the earth on either side of the ditch so that it can be easily filled in around the walls at the proper time, but pile it far enough back so that it will not interfere with the work of building the walls.

Excavate for the boiler pit next, excavating to a depth of 4 ft. 9 in. or 5 ft., as indicated on the Longitudinal Section on Plate II, which shows a distance of 4 ft. 6 in. from the main floor to the top of the pit floor. Dig the walls down straight from the mark, if the soil or ground is solid and will hold up as described above, for the trenches, but if the soil is such that it caves in, make the excavation larger, so forms can be built for the concrete. Excavate for the steps, letting the bottom slope from the outside mark down to the bottom of the pit, or better still, cut steps in the earh as indicated on the North Elevation, Plate II, so as to make a more firm bearing for the concrete when it is put in place for the steps.

Now dig the 12x12 in. holes for the column footings, making them at lease 12 in. deep, and if in the filled in part of the grounds, deep enough to reach the solid earth. The same methods will apply here in regard to the solid and loose earth or soil as stated above for the trenches and boiler pit.

That is all the excavating needed for this building. If the earth or soil is solid, be sure and get all the sides perfectly straight and plumb so that the concrete wall, when poured against same, will be straight and true. But use this method only when the earth is perfectly hard and solid. If it is loose as stated in the previous paragraphs, make the excavation large enough so that the forms can easily be built and tamp the bottom solidly, so that the concrete will have a firm bearing.

Forms For Concrete: All concrete work requires forms or moulds into which to pour the concrete, and after the excavating is done, these are to be built and placed in position.

Any pine lumber will do for the forms and you can use the shiplap and the 2x4s and other lumber that you have ordered for the upper part of the building, but be careful in cutting it that you do not cut it up so it cannot be used later in the places and for the purposes for which it is intended, and for which it was ordered. It might be a good idea to get some extra lumber for this, but if you read the description under "Framing," describing how to cut the material up for the frame, you can cut such lengths that will work in properly for both the forms and the building later.

The trenches can be fixed up first. If the ground or soil is such that no forms will be needed, lay a row of 2x4s or 2x6s into the ground on each side of the trench so that the top of them is about flush with the earth floor and so that they are exactly 6 in. apart, and so that the inside edge of the outside 2x4 or 2x6 is exactly under the line. Level these up along one side, keeping them perfectly straight and equidistant apart and perfectly level with each other across the top, so that the wall will be straight and true and have a perfectly level and square top. Do this on both sides and ends, laying the inside edge of the outer pieces of lumber immediately under the line and the other piece of lumber exactly parallel with 6 in. between, and level them up so that the level will show all level, no matter how or where it is placed down on the 2x4s or 2x6s, marking the top of the wall. These can be secured and made solid by any method you may fancy, nailing them together with splices and nailing them to stakes and tying together with wire, or in other ways, making them secure and solid, so they cannot very easily be moved, but do not brace and tie them so that the concrete cannot be poured and so that they cannot be removed. Be careful about sawing and cutting as stated in the previous paragraph.

Make eight of these 4 or 6 in. high forms for the column footings, making them 12x12 in. inside. Set these in place solidly so that they will not move when the concrete is being poured and tamped. Set these so that their top will be flush with the top of the wall pieces and so that they are perfectly level. Line them up with the side and end walls by sighting across the top of the walls and by stretching lines across perfectly taut, so that there will be no sag. Take care that these are perfectly level and flush, so that you will encounter no trouble when you are ready to set the columns.

Now build the forms for the boiler pit. If the earth is solid the outside edge can be taken care of in the same manner as for the trenches, but the inside will require a form that is 4 ft. 7 in. high around the walls, and form the steps as shown on the Drawings. Build these so that the finished pit will be 6x8 ft. inside as marked on the Drawings. Nail the boards onto upright braces, horizontally—the braces being placed about 2 ft. apart and braced across to the opposite side so that the walls will not be bulged in when the concrete is poured and rammed. Build the forms for the steps which need only to be the risers and the pieces at the side to hold them. Nail these all together solidly, but in such a way that they can easily be removed when the concrete is sufficiently set. Keep the tops of these forms level with the other forms or strips around the trenches, so that all the concrete work will come up to the same level. These inside forms in the pit are to set a few inches above the earth floor so the concrete, for the floor can be poured at the same time as the other for the walls is poured.

So far only the forms to be used with the solid, hard earth have been considered. Those for the loose earth or soil will have to be different. If you have encountered the loose earth, build the forms for the trenches 18 in. high, the full height of the wall, and reaching from the bottom of the excavated trench up to the level of the floor. Nail the boards horizontally onto the vertical cleats or braces which are to be spaced about 2 ft. apart, and then tie these forms together, using hay-baling wire and brace them to the earth bank of the trenches until all is secure and solid. Line them up and level up as described above in referring to the 2x4 or 2x6 in. forms at the top of the trenches so that the concrete wall will be perfectly true and straight and have a perfectly level and flat and square top. Do this all around the walls so that as stated above, you can put your level down any place and the air bubble in the glass will show level.

The boxes for the column footings are to be 12x12 in. inside and to be built as high as the holes for them are deep and level the tops of these up carefully as stated in the previous paragraphs, referring to the footings or piers so that their tops will be flush and level with the top of the wall forms. Secure these solidly, seeing so that they are all in line both cross-ways and long-ways of the building.

The inside forms for the boiler pit to be built the same as described above but instead of the earth banks and the 2x4's. or 2x6's. around the top on the outside, build an outside form so that it will be 6 in. away from the inside form, making the inside measurements of the outside forms 7 ft. x 9 ft. And the inside measurements of the stair projection 4 ft. x 3 ft. 6 in. wide. These outside forms to reach clear to the earth floor and to be level with the inside forms on top. Tie these together with wire and brace to the earth bank so that the pouring and ramming of the concrete will not bulge them.

Before all the forms are in place for the boiler-pit, excavate and lay a drain pipe as described under "Drain" in later paragraphs.

Be sure and have all the forms level and true, so that all the concrete work will be straight and true and level on top, before leaving them or calling them done. The lines can now be taken down, having served their purpose for the time being and you can commence pouring the concrete.

Concrete: Concrete is made by mixing broken stone, gravel, fragments of brick or cinders or other similar material, called the aggregate, with cement and sand in the proper proportions. Lime is sometimes used instead of cement, but it is not nearly as good as portland cement for this purpose.

For mixing the concrete, provide or build a platform 8 or 10 ft. wide x 12 or 14 ft. long. This is to be laid flat and be approximately water tight and is to be put together solidly, and is to lay solid on the ground so it can be worked on without it tipping up at one end or the other.

Use a good, reliable standard brand of portland cement and use sand that is clean and sharp. Sand that contains dirt or other foreign matter should not be used and the sand should not be fine. A course sand is better, and a mixture of coarse and fine is the best. The aggregate can be broken stone or crushed rock, as it is called, gravel, cinders, or pieces of hard burned brick or other similar material, or these mixed, so you can select and use the material that is easiest to obtain and costs the least in your locality. The broken stone should be clean and free from dirt and should not be in larger pieces than will pass through a 2 or 2½ in. ring, and should range in size from about half an inch up to the above mentioned sizes. The gravel should be coarse and free from dirt, and should vary in size from ½ to 2 in. and cleaned of sand and smaller stones by passing over a quarter inch mesh sieve. If cinders are used get such as are nearly all vitrified clinkers, and pass them over a ⅜ in. mesh sieve so that no clinkers smaller than that will be used in the concrete. Common, ordinary cinders are not fit for concrete, but make excellent packing to tamp into the earth before the concrete is poured. The brick-bats should be crushed up in pieces not over 2½ in. and should be mixed with gravel or stone, unless they are of hard-burned vitrified brick, which are as good as many kinds of rocks that are crushed for use in concrete.

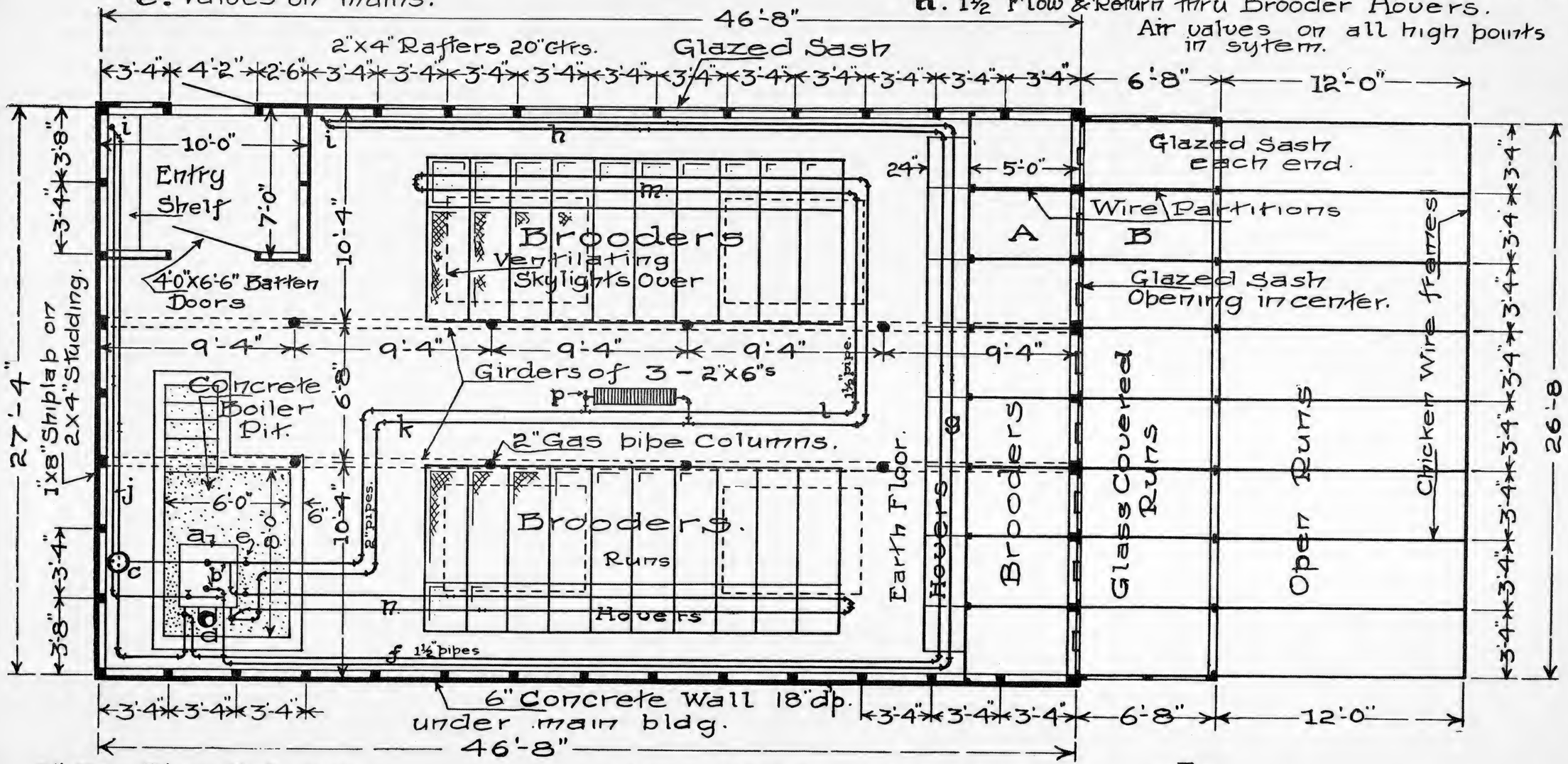
The quantities of materials in the Bill of Materials are for a mixture 1—3—6, that is: one part of portland cement, three parts of sand and six parts of aggregate. Do not mix larger portions of concrete than can be poured into the forms at once, or at least inside of three hours, for the cement in a mixture that has stood that long, has just about commenced to set and after the set begins it would be better not to use it in any important place, for it will disintergrate quickly, leaving nothing but a pile of loose aggregate and sand, for the cement is the uniting medium.

In mixing the several materials do not spare labor, and turn the mass four or five times at least, or until every piece of stone or gravel or brick-bat is covered with cement and sand. The mixing is an essential part of the making of concrete.

On the platform you have provided, mix the cement and sand dry, using one part of cement to every three parts of sand and mix until the pile is of a uniform color and then draw it over to one end of the platform. On the other end, spread the aggregate, six parts to every part of cement and three parts of sand. Wet this thoroughly, washing any foreign matter and then shovel the cement and sand in a layer on top of the aggregate, making the pile about flat on top, then with the shovel, commencing at the end of the pile that is farthest away from the end of the platform, turn over toward the end of the platform, adding water to each section of the pile, as it is turned over. After turning the pile of aggregate, cement and sand once, moving it about a foot closer the farther end of the platform, turn it again and keep turning and adding water until the mass is thoroughly mixed and wet enough so that it will flush water to the top when poured into the forms. A little experience

Hot Water Heating System.

a. Hot Water Boiler or Heater, 600 sq. ft. rated capacity.
b. 3" Mains or Header out of Boiler
c. Expansion Tank connected with a Honeywell Generator
d. Smoke stack of Galv. Iron.
e. Values on mains.
f. Flow & Return along wall, thru Hovers at **g** and along wall at **h**, ending in vertical pipe at **i**. 1½" pipes.
j. 1½" Flow & Return, ending in vertical pipe **i**.
k. 2" Main & Return connected with 100 ft 3 Col. 38" radiator at **p** and via **l** thru Brooder Hovers **m**.
n. 1½" Flow & Return thru Brooder Hovers.
Air valves on all high points in system.



2" Gas Pipe Columns are to be set on 12"x12"x12" Deep Concrete Footings.

° GROUND ° PLAN °

KELLERSTRASS PLAN OF
BROODER HOUSE
AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

N E S W

Scale of 1ft 6ft

PLATE · III ·

will soon teach you the proper amount of water so the concrete can be handled with ease. Mix each batch thoroughly and try to get all of the concrete of like density so it will dry out about the same time.

Pour each batch of concrete as it is made into the forms and keep pouring and mixing until you have all the forms full. Pour the concrete into the forms with care, not dropping from too great a height and deposit it in layers about 10 in. deep, tamping or ramming each layer solidly until water comes up to the surface, if you have not added enough to do this anyway. In the forms or trenches for the outside walls, pour each layer all around the building before commencing the next and fill these to the top before filling any other forms, while pouring the top layer, bed the anchor bolts into the concrete, placing them about in the center of the wall and spacing them about 8 ft. apart and let them project up out of the concrete about 2¼ or 2½ in. Level off the top of the concrete so it will be flush with the tops of the forms or 2x4 or 2x6 pieces, so that the top of the wall will be perfectly level and square, that there may be no trouble in laying the sill plates.

Pour the concrete for the boiler-pit in like manner, except first covering the earth floor until it is level up with the bottom of the inside forms and then filling the forms for the sides and steps. Level the floor up and keep the steps all square and level, and level up the top of the walls all around so that they will be as true and even as the outside foundation wall.

Near the southwest corner in the floor of the pit construct the pocket for the drain which is described later under "Drain," same to be formed into the concrete base and is to form a semi-circular hole with the end of the pipe projecting in from the straight side. See under "Drain," which follows the last paragraph of "Concrete" before pouring the concrete. This concrete floor is to be perfectly flat in the space indicated for the boiler on the Ground Plan, but the other parts of the floor should slope slightly so as to drain all the water to the drain.

Now fill the holes or forms for the column footings with concrete, tamping it solid and then finish on top, troweling it off smooth and even and perfectly level so as to form a good, solid bearing for the columns.

If you have fixed up the forms for a foundation for the partition around the entry, fill these full of concrete and level and smooth up. If you desire and have plenty of concrete left, dig a few holes under the outside line of the glass covered runs where the 2x4 in the ground will lie and fill these with concrete to form a bearing for this 2x4. The upper face of these concrete piers to be 1⅝ in. below the level of the foundation walls. See the Section on Plate V. This is not necessary, but provides a place so that any concrete that may be left over will not have to be dumped out on the ground. After all this is done, in a workmanlike manner, the concrete work is finished.

Let the concrete stand in the forms for two or three days and then if it is hard and will hold up, remove the forms. Immediately after the forms are removed or what would be better, remove the concrete forms in the boiler-pit as soon as the walls will hold up and give the floors and steps about a 1 in. coat of cement and sand top coating, and the concrete walls on the pit side a thick enough coat to cover all rough places. Trowel it all out smooth and even and sprinkle some dry cement into the surface, and trowel it in. This top coating is to be a mixture of one part cement to two parts sand, thoroughly mixed dry and then enough water added to make it work smoothly under the trowel.

If the weather is hot and dry, sprinkle the concrete two or three times a day thoroughly with water from the time it is poured until after the forms are removed, so that it will not dry out too soon, and if the sun is blistering hot, shade the work, and if you lay the concrete in freezing weather, cover it cartfully so that it will not freeze. After the forms are removed and the walls all solid fill in around them with loose earth, tamping it down solid, and you can call the foundation part of the work done.

Drain: The first part of the work herein described will have to be done before all the forms in the pit are set and the latter part to be done when the concrete and top coat work is being done.

A convenient distance outside of the west side wall line start to dig a trench running it in the direction that will bring it the quickest to a place in your grounds that is lower than the floor of the boiler-pit. If your ground is about level run this trench straight out or in any direction so that it will end 15 or 20 ft. away from the building. From the end of this trench that is close to the wall line, and the bottom of which should be a little lower than the pit floor, tunnel through the earth, making a hole large enough to pass the drain pipe you have provided through. This is to enter the pit near the southwest corner about 10 in. from the south wall so that the drain pipe will be about 4 in. inside the inner wall line. This hole can be made with an earth augur made for this purpose or you can use a common post augur, if the distances aren't too great, working from each side. Or, use a common spade or if the earth is loose enough plug up the end of the pipe with a screwed on metal pipe plug or cap and push the pipe through the earth. This will be a hard job if the ground is hard and solid, but if it is loose and soft, ought to be done easily. When this is tunnelled through, insert the drain pipe, letting it project far enough into the boiler-pit, so that it will come just inside the wall line, and set it at such a height that the top of the pipe will be about flush with the concrete floor, or, in other words, will pass just under the inside form. Plug this end of the pipe up so concrete or dirt will not get into it.

Lay the rest of the drain pipe in the trench letting it project about a foot out on the low side of the ground, or, if the trench is only 15 or 20 ft. long, dig a hole in the end and fill with broken stone, gravel or some similar material and run the end of the pipe into this. The several lengths of pipe necessary to reach from the pit to the other end of the piping, to be screwed together with the couplings provided with each length of pipe. The pipe is all to be laid so it will slope slightly from the pit to the outside end of the pipe. Now cover the rock or gravel with a few boards and fill the trench with earth, covering the board and the pipes, tamping it solidly as each layer is filled in. Fill the tunnel and tamp the earth into it solidly.

Now the forms for the pit can be completed, and the concrete poured into place. When placing the concrete on the earth floor form it into a semi-circular pocket or hollow where the drain pipe comes inside the wall or forms, the pipe coming in on the straight side and form this pocket so that there will be a space of about a half inch between the lower side of the pipe and the concrete at the bottom. This space to be later filled with cement top coating. The top coating that is to be put on is to slope toward this drain pipe pocket and form the cement coating into it, making it smooth and filling up the bottom so that the water will run into the pipe and not leave any drippings in the bottom of the pocket. While the cement is still wet, press a piece of one quarter inch mesh galvanized wire into it, covering the pocket so as to form a strainer.

Anchors and Sill Plates: The anchors are to be common ½ in. bolts, not less than 10 in. long, and are each to have two large washers, and a nut. The washers are to be large size and one of these is to be bedded into the concrete and the other one is to be placed on top of the sill plates, all as shown on the Section on Plate V. Place these in the concrete as described under "Concrete," spacing them about 8 ft. apart and letting them project 2¼ or 2½ in. out of the top of the wall as stated. They are to be set in the wall perfectly vertical.

The sill plates are to be of 2x4's. laid straight and level on the foundation wall, securely held by the anchors and are to be bedded in a grout mortar. The size of the sill on the outside when it is all nailed up is as marked on the Ground Plan, Plate III, 27 ft. 6 in. x 46 ft. 8 in. The grout mortar is a mixture of cement and water with a little sand mixed to the consistency of a thick paste.

It will take about eleven of the 14 ft. 2x4's. for the sill, so pick out that number of solid straight pieces and square up the ends that will butt and cut notches in the ends of four of them for the corners. These notches will be 1⅝ in. deep by 3⅝ in. broad, as indicated on the Detailed Plan, Plate IV which shows the corner. The front and rear sill plates to be exactly 27 ft. long with square ends. All the joints where the different lengths butt are to be securely toe-nailed together. The side sill plates will be 46 ft. 8 in. long with a notch at each end which is to fit over the ends of the front and rear sills. Before nailing these all solid, fit them in place, boring a hole in the proper places for the anchors, and lay all the several lengths in place, laying them straight and true with their outside edge about 1 in. inside the outside face of the foundation wall. After all is fitted, you can nail the butted joints together by toe-nailing and nail the side and end plates together at the corners, using 20 d. nails, securing all solidly and keep them all straight and true.

Now lift the plates up as you go along and spread the grout mortar on the wall, bedding the plates well into it. Go all around the wall, working as quickly as possible or have two or three to help, so that this may be done quickly and press the plates into the mortar, levelling them up, and do all in a workmanlike manner. Now slip the washers over the projecting ends of the anchor bolts and put the nuts on and screw them down only sufficient to hold the sills in place, not drawing them tight until the mortar has thoroughly hardened and the sills are dry.

If you have put in a foundation for the entry partitions, put in the plates in the same manner as described above, bedding them in mortar, making one 6 ft. 9⅛ in. and the other 9 ft. 5½ in. long, and nail these together solidly, making them level and true. If you have not put in the foundation, these need not be put in until you are ready to put up the partition—see under "Entry."

Do not do any work on top of the sills until the mortar is thoroughly hard. Space and mark off on the sills for the studding as shown and marked on the Ground Plan, Plate III, and be sure to get these exact, so there will be no botch work.

Wall Framing: Take twenty-four 14 ft. 2x4's. for the studdings, and cut fifteen of them up for side studs, the lengths of which are given on the West Side Elevation on Plate I, and as follows: cut two 8 ft. lengths and two 5 ft. 8 in. lengths out of two pieces of the 14 ft. stuff, cut two 7 ft. 10 in. lengths and two 5 ft. 10 in. lengths out of two more 14 ft. pieces and proceed in the same manner until you have the other lengths cut, which are: 7 ft. 8 in. and 6 ft.; 7 ft. 6 in. and 6 ft. 2 in.; 7 ft. 4 in. and 6 ft. 4 in.; 7 ft. 2 in. and 6 ft. 6 in.; 7 ft. and 6 ft. 8 in.; as marked on the Drawings. This leaves a 14 ft. 2x4 left out of the fifteen, which cut up into two 6 ft. 10 in. lengths. Now you have 15 different lengths with two of each length, making a total of 30 studdings for the two sides. The tops of these may be bevelled slightly as indicated on the Section on Plate V. Take five of the other 14 ft. 2x4's. and cut five lengths 8 ft. and five lengths 5 ft. 8 in., these for the rear and front studdings. Take the four 2x4's. left and cut into eight pieces for the front and rear studding that come under the ends of the girder. These are to be bevelled on the top so that the girder will have a full bearing on same. Get the bevel off of the Drawings by laying your bevel on same and setting accordingly. The longest edge or side of four of these 2x4's. is to be 6 ft. 6⅜ in., the bevelling making the opposite side shorter; these for the rear. The shortest edge or side of the other four pieces are to be 5 ft. 2⅜ in., making the long side that distance plus the height of the bevel. Nail these together in pairs so they will be ready to set, taking care to get their ends and edges perfectly flush.

Now take eleven more 14 ft. 2x4's. and square up the ends to be used for the cap plates which set on edge on top of the studding. Take four of these eleven and cut them up for the front and rear cap plates or horizontal rafters as they might be called, and make these so that when they are butted together there will be two lengths 27 ft. ¾ in. Take three of the 14 footers out of the eleven and take a fourth and cut it in half. These to be used for one of the side cap plates or sloping-rafters. The other three and one-half pieces to be used for the other side.

Now raise the frame, using your own judgment about the method of procedure, or proceed similar to the description following, though any method that gives the desired results is all right.

Take the pieces that are intended for one of the side cap plates and lay them near one of the sill plates, butting them tight where they come together and let them slope at the same rate that they will when up in position, which is a rise of 2 ft. 4 in. for the entire length, and let the ends project about equally over each end plate, these to be cut off later. Lay these out perfectly straight, and toe-nail together at two joints, making two sections of it. Nail on a couple of splices at the joints, placing them on the outside of the plate. Now distribute the studding for that side and space them exactly as marked on the sill plate which is marked off according to the measurements on the Ground Plan, Plate III, which are to be followed exactly. Toe-nail the ends of the studding fast to the cap plate, after they are all properly set so that they will be plumb and square when raised. Nail a couple temporary diagonal braces across each section so as to hold the studding secure and straight, so that they will not wobble and loosen the hold of the nails at the top. After the first side is completed, proceed with the other side in the same manner, and, if you wish, you can nail up the end framing and raise it up in the same manner as the sides, although the method herein described will differ so you can use whichever way you like. This method of nailing the frames together and raising them as a whole, is as good as any. The temporary braces are to be nailed on securely so as to hold everything rigid, but do not drive the nails clear in, but let them project enough so they can easily be removed with a claw hammer.

After all the framing is ready, raise one of the side sections, and, after it is plumb, run a brace from the corner stud to the sill plate, and from the innermost inside stud to a stake in the ground. These two will be enough if it is not windy, but which may make one or two more braces necessary. Before nailing the braces solidly be sure that the wall is perfectly plumb and the studs plumb and square and then secure the braces and toe-nail the studs to the sill plate, seeing that they are spaced directly on their marks as in-

3'-4"

3'-4"

Y

Heating pipes

12"

2'-8"

7/8"X11½"X2'-7" Boards

2"X4" Studs

½"x10" Anchor Bolts about 8ft apart

2"X4" Roof Joists 20" Ctrs.

Partitions and end pieces 7/8"X13"X2'5 long notched for pipes.

2"X4" Sill Plates 2 lengths 13'-6"

Earth Floor.

3'-4"

5'-0"

7/8"X11½"X3'-4" Boards

2½" Holes covered with Fly Screen

Cord above for raising Door

These frames hinged at top and furnished with hooks and eyes.

1" Mesh Chicken Wire on frames

These frames are Stationary

23"

Y

Check rails of sash placed together here

X

4"

Check rails of these Sash Down

Frame here same as others but without wire

6'-8"

Lower center light of sash removed and replaced by slideing Door Detailed below.

3'-4"

36"X36" Divided 6 Lts 1⅜" Sash. those on side same.

2"X4" on ground 2 lengths 13'-4"

Wired Frames for Open Runs

X

Latths

Same

This board or Door cut as shown on top and to slide easily in frame. which is to be nailed to Plate.

7/8"X5⅛"X10"

¾"X10"X20"

¾"X2"X17¾"

⅜"X⅜"X16"

11½"

3½"X2"X17¾"

7/8"X2"X10"

• DETAILED • PLAN • of • A • & • B •
• on • Ground • Plan •

KELLERSTRASS PLAN
OF
BROODER HOUSE
AS IT IS BUILT ON
THE KELLERSTRASS FARM
KANSAS CITY, MO

Scale 0ft 1ft. 2ft.

PLATE • IV •

dicated on the Drawings. Now raise the other section, bracing it and toe-nail the cap plates together where they butt, and, if necessary, put on a temporary splice and plumb up the studs and toe-nail them. The splices are to be removed when the rafters are placed, if they interfere then or when the shiplap is nailed on. Proceed in like manner with the other side, making all secure and then, if you have nailed the end frames together, raise them in a similar manner and nail them fast, and if you have not nailed them up, proceed as described in the following:

Put one length of the front or rear cap plate up, letting it rest on the corner stud on one end and hold the other up by placing a stud temporarily under it. Put the other part up, nail the ends fast to the top of the corner stud and nail through the side cap plate into the end of the end plates, and toe-nail the pieces together where they butt; place the studs under in their proper places and nail fast, toe-nailing through the cap plate into the stud, and toe-nailing the studs fast to the sill plate. Be sure each stud is set right and plumb before nailing in solid. Nail all the studs in in this manner, moving the temporary one over to its proper place. Raise the other end in like manner, putting up some braces if necessary. The doubled studding for supporting the girders will have to have a splice put on the outside, for they will not reach up to the plate. Put the splice on the outside edges and nail them fast to the studs or posts and then to the plates, of course nailing onto the side of same, and toe-nail the posts fast at the bottom. These splices to be removed when the girder is placed or when the shiplap is ready to be put on. These posts are to leave a distance of 5⅝ in. from their tops to the bottom of the cap plates. The vertical faces of the plates are to be perfectly straight up and down and the outside face is to be flush with the outside edges of the studding. After all is nailed solid and secure, saw off the projecting ends of the side cap-plates or sloping-rafters, making the cut vertical and flush with the outside face of the end cap plates.

After this is done, the outside framing is complete, except for a horizontal cross piece over the door opening, which will be about 4 ft. long and can be gotten out of a piece left from cuttng the entry plates. It is to set perfectly horizontal and square with the studs and about 6 ft. 5½ in. up from the sill plates. Nail securely through the studs into it. The framing is to be nailed up with 10 and 20 d. nails, using the long ones wherever the shorter ones will not reach or hold sufficiently.

Girders and Columns: The frame is all up and the columns and girders will have to be put up before the roof joists can be placed in position.

The girder is to be built up of three 2x6's. as marked and shown on the Drawings, and is to be continuous throughout its length. That means that there are to be no joints in it except those where the 2x6's. are butted together and these places or joints are to be so distributed along the length of the girder that no two of them come on a line and try to get them so that they will be about the same distance apart, which distance will be about 6 ft. when using the 18 ft. 2x6's. Lay these 2x6's. on the ground, distributing the joints as above stated and with the surfaced edges down and the two outside 2x6's. to have their surfaced sides out. Now nail these together so that there will be 3 or 4 sections of girder with the ends of one 2x6 projecting 6 ft. beyond the other, so that when they are up they can easily be nailed together. It would be too cumbersome to nail the whole length of girder together before raising it up and it is easy to nail it together into sections, so that only a part of it will have to be raised at the time. And then nail together after it is in position. Prepare both the girders in this manner, and while they are on the ground, get the proper length and bevel for the end and cut them off. They will be the same length as the sloping cap plate and the bevel will be the same pitch, so it will be an esay matter to do this. That prepares the girders so they are ready to go up.

The pipe columns are to be of 2 in. pipe and are to have a heavy flange at each end such as are used for flange unions, which are to be screwed on tightly and the ends of the pipes are to come flush with the flush face of the flange. The pipe to be common steel or galvanized gas or steam piping, cut to the lengths shown on the Plans, with square ends. The pipes are to be threaded properly where bought so you will have no trouble in getting the flanges screwed down the proper distance. Distribute these in their proper places and they are ready.

Prepare a grout mortar which is cement and water with a little sand all mixed together forming thick paste. Prepare eight wedges of wood that will be about 5 in. wide and about 8 in. long, that will slope at the same pitch as the girders, which is shown on the Drawings, and make these so that one edge will be nearly sharp and let the butt come whatever thickness it will when the slope is cut. One of these wedges is for each column and they are to be slipped in between the column flange and the bottom of the girder, so that the girder will have a full bearing as it goes up the slope. These wedges ought to be made of hard wood.

Before going further, it would be well to provide some way so that the columns can be set exactly where they belong so they will all line up properly. You can devise some scheme of your own or use a line stretched from one post, that is to support the girders, to the other, stretching it taut and in such a position that it will mark exactly where one side of the column is to set, and the side toward the center is recommended for this, so that in case the columns are set crooked they will allow that much more space for the brooders on each side. Stretch the line across from the center of the wood post at one end to the other at the other end, and then take half the outside diameter of the column and mark on the footings and the post that distance which is 1.185 in. exact or 1 3-16 nearly, away from the line, and then stretch the line even with these points, so it will show exactly the line that the outside of the columns are to make. Cross lines can be stretched crosswise in the same manner, so as to keep each pair of columns even. Stretch these lines only a short distance above the ground so the bases of the column can be set square without any trouble. After these lines are up for both rows of columns, proceed with the work.

You are now ready to raise the columns up and place the girders on top. Starting at one end, preferably the lower, raise the proper section of the girder up with one end resting on the wood post and stick a piece of 2x4 underneath to help support it. Clean the top of the footings off, spread some of the grout mortar on top of it, raise the column up and set one end down squarely on top of the cement mortar, with one side of the column just touching the line, for if the line is pressed out, it will make the line of the columns crooked. Hold the column plumb as it is bedded in the mortar and lift the girder over on top, shove one of the wedges in between the flange top and the bottom of the girder, and then sight across from the bottom of the side cap plates, or use a line stretched tightly, and when it is perfectly on a level, drive a nail through one of the holes in the flange, through the wedge, into the girder. During this time be sure and keep the column perfectly plumb and true. Now put a 14 ft. 2x4 up resting with one end on one of the studs, with the end touching the side plates, and nail it fast only temporarily for the present, and with the other end passing over the girder to hold it in place, toe-nailing the joist temporarily to the top of the girder and drive a few nails at the wall end of the girder to hold it there. Raise the corresponding section of the other girder up in the same manner and then raise the other sections and the other columns until the girders are one continuous piece, lightly nailed together. Be sure to keep the columns in a straight line and see that they are perfectly plumb. Put up as many 2x4 roof joists for braces as are necessary to hold all solid. After all is up thus temporarily nailed together, look over everything so as to be sure all is done in a workmanlike manner, then go over it all and nail the different sections of the girders together solidly and toe-nail them fast with the studs or posts and the cap plates at the ends, and nail or drive screws through the holes in the flanges at the top of the column into the girders, holding all secure, and keep the wedges square and even. After all is solid, except the braces or joists which are only nailed temporarily, go over the bases of the columns, filling the holes with the grout, and covering the flange with a thin film of it, so as to make that part as rust proof as possible.

Roof Framing: After the girders are up and all true and straight and the mortar under the columns has sufficiently hardened, place the roof joists in position and nail them fast.

These are 2x4s and are to be left the full 14 ft. length only squaring up the end that is to butt into the side cap plate, the other end need not be touched, unless it is too rough and scraggly. One roof joist is to be placed over each studding and one between, and they are to lap each other at the center and be securely nailed to each other. Toe-nail them fast to the top of the girder and toe-nail those that come over the studs to same, and nail all of them fast at the outer ends by nailing through the sloping or side cap plates into their ends, making all secure. The temporary braces can be righted and nailed fast, as they are reached, for the roof joists form more substantial braces. The joists are to set with their top edge sloping with the top edge of the sloping cap plates.

As the opening for the sky-lights are reached, which are indicated by dotted lines on the Ground Plan and are shown on the Section on Plate II and detailed on Plate VII, frame for same by doubling the roof joists as shown on the Detail at that point. The extra joist needs only to run on to the girder, so the space in the center will be the same the entire length of the building. Put in the pieces that slope up with the roof to hold the ends of the other joists which come into it as shown on the Detail. These also to be doubled. A good method of working would be to place the two regular rafters that come over the studs in, as shown, then fit in the outside pieces that slope, nailing them fast, by nailing through the regular rafter. Now put in the pieces of rafters that butt into the sloping pieces and nail these fast, nailing through the sloping pieces, then put in the secondary sloping pieces, nailing them securely, and then put in the secondary, horizontal rafters, nailing them securely all along the joists, so as to help hold the other rafters. In this way you will have no toe-nailing to do, and only 1⅝ in. thicknesses to nail through. This makes a good job. Line all of the skylight openings up lengthwise and crosswise so they will make a presentable appearance.

Use 10 and 20 d. nails in nailing fast the roof joists. It will take about 66 14 ft. 2x4s for the roof. When these are all on, the frame is complete, ready to be covered.

Shiplap: The sides or the roof can be put on first to suit your fancy, but because it is a little easier to mark and saw the boards on the sides before the roof is put on, the sides will be taken up first herein.

Commencing with the west side, start at one corner at the bottom and work upwards, after having previously removed any braces that might be in the way. Take a piece of shiplap and place it so that one end will cover only half the edge of the inner studding and let it project what it will over the corner stud and nail fast, nailing to each stud with about three 8d. nails, or only two as the case may require. Lay the next board above, so that it does not strike the same stud on the inside as the first board and let it project what it will over the end or corner stud, and do the same with the third board up, so that none of the ends of the boards will be above each other. Now you can saw off the projecting ends about flush with the outside of the corner stud. Now nail the next bottom piece of board on butting it up tight to the first board, put on and cut it so it does not cover more than half the stud at the other end. Do the same with the two above and continue in this way, breaking joints every three boards if you have secured 10 ft. stuff or twice as many times if you have 20 ft. stuff. In cutting, mark all the ends off square and saw to this mark so that all ends will be square and true. Proceed to nail the shiplap on lapping it correctly and driving it close together and breaking joints, until the boards that will project above the sloping rafter or above the roof, are reached. Place these up in position and mark them on the back along the slope and then saw off on this line and lay the pieces that are cut off aside, for the other side, unless some parts of them can be used to advantage on this side. After they are sawed off to fit the slope, place them up and nail them fast.

Now shiplap up the rear in the same manner as described above, breaking joints and make the shiplap reach as far as it will over the corner studs, and then patch up in the best possible manner, so that it will all be done in a workmanlike manner. The rear and west side are solid, having no openings, as shown on the Elevations on Plate I and II.

Shiplap up the east side in the same way as described for the west, except that there will be openings here to arrange for, as shown on the East Elevation, Plate I. At the door, let the ends and edges of the shiplap come flush with the inner face of the 2x4s all around, and the shiplap can be nailed on and sawed off after it is all on, if desired. The opening for the small sash is to be 24x24 in., or whatever the outside size of the sash you have obtained for this is. On the inside along the edge of the opening, put a casing on of 3 or 4 in. wide stuff, ripped out of waste pieces of shiplap to hold the ends of the shiplap firm and also to form a substantial frame for the sash. The long opening for the large sash is to be the height of the sash, which will be about 3 ft. 3½ in., if common check rail sash have been obtained. But, to be sure, measure the sash and make the opening of a height so the sash will fit in snugly, necessitating a little dressing or fitting. The height of the opening above the floor is to be three boards or about 21 in. Plane the rebate off of the top board and then rip the board that will come above the sash so the opening will be the desired height. The ends of the shiplap which are secured to the studding at the north end of this opening is only to cover half of the 2x4, the other half of the edge is for the sash to rest against when they are put in place. Be sure and get these openings sized accurately so you will not encounter any trouble in latter work. Place the pieces up the slope and mark them, saw them off and nail in place. The triangular pieces left from the cutting of the west side are to be used here and will save considerable cutting as the slope is already cut on them.

The front is next, so measure up the height of the sash as shown on Plate V and indicated on the Front Elevation, Plate II. This distance will

Asbestos Roofing on 1"x8" Shiplap.
2"x4" Roof Joists 20" Ctrs.
Large Eyelets
3"x3" Hinges
7/8"x5½"x4'-4"
5½"
7½"
Small Pulleys
Heavy White Cord
1" Mesh Chicken Wire 4'-4"x5'-2"
2"x4" Stud 5'-8" long
5'-8"
7/8"x3⅝"x5'-10"
7/8"x3⅝"x5'-10"
7/8"x5½"x12'-8" two lengths
Hot Water Pipes
7/8"x1½" loose board
Eyelets for Hooks
7/8"x3⅝"x2 lengths 12'-8"
Frame and Sliding Door per other Detail.
Double Split felt 3'-4" long.
Hover Partitions 7/8"x15"x23" notched for pipes. Use 1½" Stuff with 1½ piece on top.
1½" Pipes
7/8"x½" Stops
2"x2" Hinges
7/8"x7½" Doors same length as boards on top
2'-1"
Cleat.
Removable Wood Floor
2"x4"s total width of bldg.
Black Soil to be filled in up to Dotted Line
2"x4" Sill Plate
½"x10" Bolt.
6"x18" Concrete Wall
7/8"x5½"x4'-4"

7/8"x3⅝" all around Bldg

• PLAN • of • HOVER • FLOOR •

Handles
8d Nails
2"x4"
1"x6" Flooring.
Partitions
3'-3" in center parts and 2'-6½" at each end
2'-2"
7/8"x2"x17⅝" Cleats
7/8" Strip nailed on end of Partn. under 3⅝" Board
7/8"x2"x2'-4" Strips

7/8"x5½"x26'-8"
7/8"x5½"x6'-4"
5½"
7/8"x5½" x 13'-4" 2 lengths
2"
This space may be left open except at each end which are to be closed with a 7/8" board.
3'-4"x7'-0"x1¾" outside measurements of skylight Sash
1" Mesh Chicken Wire 6'-3"x3'-0" High
Common Lath nailed at joint.
7/8"x3⅝"x3'-10"
7/8"x3⅝"x3'-10"
2"x4" laid in ground on rocks or bricks.
20d Finish Nails.
7/8"x5½"x6'-4"

• SECTION • THRU • A • & • B •

KELLERSTRASS · PLAN OF
BROODER HOUSE
AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0ft 1ft 2ft

PLATE · V ·

be about 3 ft. 2 in. from the sill up to where the shiplap is to start. Put this lower and first piece on straight and true and nail it solid and then nail the pieces above, breaking the joints and finish at the corner in as workmanlike a manner as possible.

Nail all the shiplap on solidly with 8d nails as stated above and force the pieces tightly together, the vertical joints to be made as carefully as possible, to get them tight, doing all in a workmanlike manner. That finishes the side walls.

The shiplap for the roof to be laid in the same manner as described for the walls, breaking joints, nailing solidly and making tight joints. Commence at one side with some boards off of which plane the outside rebate, and project these as far as possible to get a good nailing hold over the side walls to form the side eaves. Make the projection over the front and over the rear, the same, and then nail solidly, butting the joints between the boards with care. On the opposite side nail some boards on in the same manner, planing off the outside rebate and make the projection over the rear and front the same as on the other side. Stretch a line between the ends of these, to which lay the roof boards between them, that cover the roof. Lay these close, shifting them enough so they will work out properly with the boards on each side. If this cannot be done, rip a piece off and fit it in. Saw the shiplap off square and straight and flush with the 2x4s, forming the openings for the skylights as shown on the Drawings. After the roof is all covered and all nailed solid, mark off across the front and rear, a straight line and saw off all the irregular projections of the boards, making straight edges all around on to which nail the roofing. That finishes the exterior shiplap work. There will have to be a hole cut and a tin plate provided for the boiler chimney. See under "Heating," but this can be delayed until later.

If instead of providing shiplap for the roof, you have provided the sheathing per the Material Bill, proceed in the same manner as described for the shiplap, keeping the joints as close as possible and nailing solid, and cut out any pieces of lumber that may have holes or loose knots or be rotten, so that the roofing will not get a good base to rest on.

Ventilating Skylights: Before the roofing can be placed the skylight frames will have to be built and placed, so the whole skylight will be described herein.

It will take about four 14 ft. 2x4s for each skylight frame or some of the waste pieces that have been cut off while the framing was being cut, can be used. There will be four 7 ft. 5¾ in. lengths, four 4 ft. 10 in. lengths, two 12 in. and two 8 in. lengths for each frame—these are to be all nailed together as shown by the Detail on Plate VII. The four shorter pieces are to be bevelled on the top as shown by the Detail, and the longer 2x4s are nailed together by nailing through the 4 ft. 10 in. lengths into the end of the 7 ft. 5¾ in. lengths, and when these frames are built the short upright pieces are put in and toe-nailed fast. Nail all securely, so that the wind will not twist it out of shape. Build the four frames in this way and all the same size, and then nail them fast to the roof, being careful to get them on a line so they will look well when done.

The skylight sash are to be as detailed and can be procured at a Lumber Yard or Planing Mill or a Sash and Door Factory, and are to be screwed onto the frame. Bore holes in the sash for the screws to pass through and counter sink these if the ordinary screws are used. And then secure in place. If round-headed screws are used, the counter sinking will not be necessary. This need not be done until the roofing is all on and the other sash are being placed so as to lessen the liability of getting the glass broken.

The sides of the frames are to be covered with light-weight canvas, per the Detail, which should not be put on until the sash is ready to be put in place permanently. This is to be tacked on with 3-oz. tacks, not more than 3 in. apart, and is to go clear around the frame, leaving no part exposed to view and is to come down over the roofing as shown on the Detail.

Roofing: After the 2x4 frames for the skylights are nailed fast to the roof, the roofing can be applied, making the roof water tight.

The roofing is to be a good ready roofing of asbestos or other standard brands, of which there are numbers on the market, all good. The roofing usually comes in rolls with enough roofing nails and roofing cement rolled up in it to lay each roll. In laying the roofing follow the directions of the manufacturers, which will insure you a good roof.

Start laying the roof at the front or lowest point in the roof, laying one width or strip of roofing across the entire width of the building, turn it over the front edge and nail it fast and nail or do not nail at the upper edge, according to the directions. Turn the roofing over the edges at the sides and nail it fast there, letting it project about half an inch below the under side of the boards to form a drip. Let all the roofing project down in this manner, so that water will not get on the under side of the roof boards. After the first layer or width is down straight and laid in a workmanlike manner, lay the next width of roofing, giving it a good lap over the first strip, making this as directed by the manufacturers, and cement it fast and nail it according to the directions. Continue in this way until all the roofing is laid, cementing the laps and nailing as the directions say it should be done.

Turn the roofing well up on the skylight frames and cement well at the joints and nail fast, making all water proof around these frames, so that water off the roof will not come pouring in. Before getting all the roofing on, cut a hole in the shiplap for the heating boiler. If this is difficult to locate, let it go until the boiler is installed, and then cut the hole through the shiplap, roofing and all as described under "Heating." The top width of roofing to be turned over the back edge the same as in front, letting it project down at least a half an inch below the roof boards for a drip, and when all is cemented securely and well nailed down the roof is done.

Eave Strips and Corner Boards: Take eleven pieces of the 14 ft. 1x4 in. stuff for the strips under the eaves and four pieces of the same for the corner boards, which are not shown on the Drawings, but are necessary to finish the building correctly.

Place the strips up under the eaves, fitting them tightly under the projecting roof-boards and bevel the pieces for the front and back so they will fit snugly. Butt the ends carefully where they come together and nail fast, doing all in a workmanlike manner. This piece serves as a bed-mold for the eaves and covers up any places where the shiplap does not fit against the roof-boards.

Take the four pieces of 1x4 in. stuff and cut them to eight lengths that will reach from under the eave strips to the ground. Plane two of the longer and two of the shorter lengths down, so that when fitted together the corner boards will present about an equal face. Nail them together and fit the tops snugly with the eave strips, letting the bottom ends come flush with the bottom of the shiplap or top of the concrete wall. After these are fitted in a workmanlike manner, nail the corner boards on to the two rear corners, covering up any irregularities in the ends of the shiplap, but leave the two front ones off until the sash in the side and for the front runs are in place, and the necessary boards in place there. Then fit these corner boards again and nail securely in place, thus finishing placing the corner boards after the building is all enclosed.

Entry Partition: You might as well put in this partition now while working with the heavier materials, but it can be put in sooner or later to suit your inclination.

If you have the sills put in on a concrete foundation, as described under "Sill Plates," that much of the work is already done. But if not, proceed to cut your sills out of a couple 2x4s, one length 6 ft. 9⅛ in. for the short side, and one piece 9 ft. 5½ in. long for the side with the door. Lay these on the earth floor, the end of the 9 ft. 5½ in. piece butting into the 6 ft. 9⅛ in. piece, as shown on the Ground Plan, Plate III, and toe-nail together. Bed these up on brickbats or stones, so they will set absolutely level. Toe-nail the ends securely to the outside wall sill plates. Be sure to have these plates square and true and their outside edge flush with the corresponding side of the 2x4 studding, so that the shiplap can be nailed on straight.

It will take four pieces of 14 ft. 2x4s for the studding, for you cannot get two lengths of these studs out of 14 ft. These four studs will be the same lengths as the corresponding wall studding, per Drawings. Fit these in position as indicated on the plans and toe-nail fast to the sill plates and to the roof joists overhead, securing all solid and keep them all plumb and proper distances apart. After these are up, place a 4 ft. piece of 2x4 between the stud at each side of the door at the same height as the crosspiece for the outside door.

When these 2x4s are all up and solidly nailed, nail the shiplap on the side toward the brooders. Proceeding in the same way as on the outside, making all joints tight and all pieces to be nailed on solidly, closing the entry off entirely from the other portion of the building, the only opening being for the door. The ends of the shiplap at the door and on the corner to be kept square and even and present a straight line. Fit some pieces up between the rafters, so as to tightly close off those spaces, doing all of this in a workmanlike manner.

The Drawings indicate a shelf on one side of the Entry, which can be built in or left out to suit yourself, but it will make a handy place for feed, oil cans or other appliances that do not need to be used at all times. Build this out of otherwise waste lumber, nailing cleats on the walls and putting up a cleat or support in the center and nail ⅞ in. common boards or shiplap on the top, making it the desired width. Do this after everything else in the building is nearly completed, so as not to use up any lumber that should be used for something more necessary.

When this is all nailed on, the building is ready to be enclosed by the sash and doors.

Doors: The two doors, the outside and entry doors, are to be the same size and built the same. Although they are shown hinged on different sides of the studs of the Plans, this is not necessary, so if you wish you can hinge both on the same side, hinging them on the shiplap side of the wall. The flooring side of the outside door is to face out and the flooring side of the entry door is to face in, toward the boiler pit.

The doors are detailed on Plate VI. It will take 9 or 10 pieces of 1x6 flooring, 6 ft. 6 in. long, for each door, and five pieces of 1x6 in. common boards, 3 ft. 10 in. long, for the battens and braces as shown on the Detail. Cut the 6 ft. 6 in. pieces of flooring off of 19 or 20 pieces, as needed, of the 12 ft. flooring, getting one 6 ft. 6 in. length out of every piece, and lay the rest aside for future use. The battens and braces can be made out of pieces of shiplap or other ⅞ in. lumber, and if necessary the braces can be narrower than 5½ in., as they are marked on the Drawings. These braces are to be beveled, so they will fit tightly against the battens. The battens are to have square ends.

Now lay the flooring flat, with the face down and with the ends all even and straight, and lay the battens and braces in place and nail solidly, so the door will not warp or sag, driving each piece of flooring close to its neighbor, so the door will be perfectly tight. After it is nailed together, rip or plane off to the exact size of the opening provided for it until it fits snugly in same. Build the other door in the same manner and fit both properly, so they will not stick.

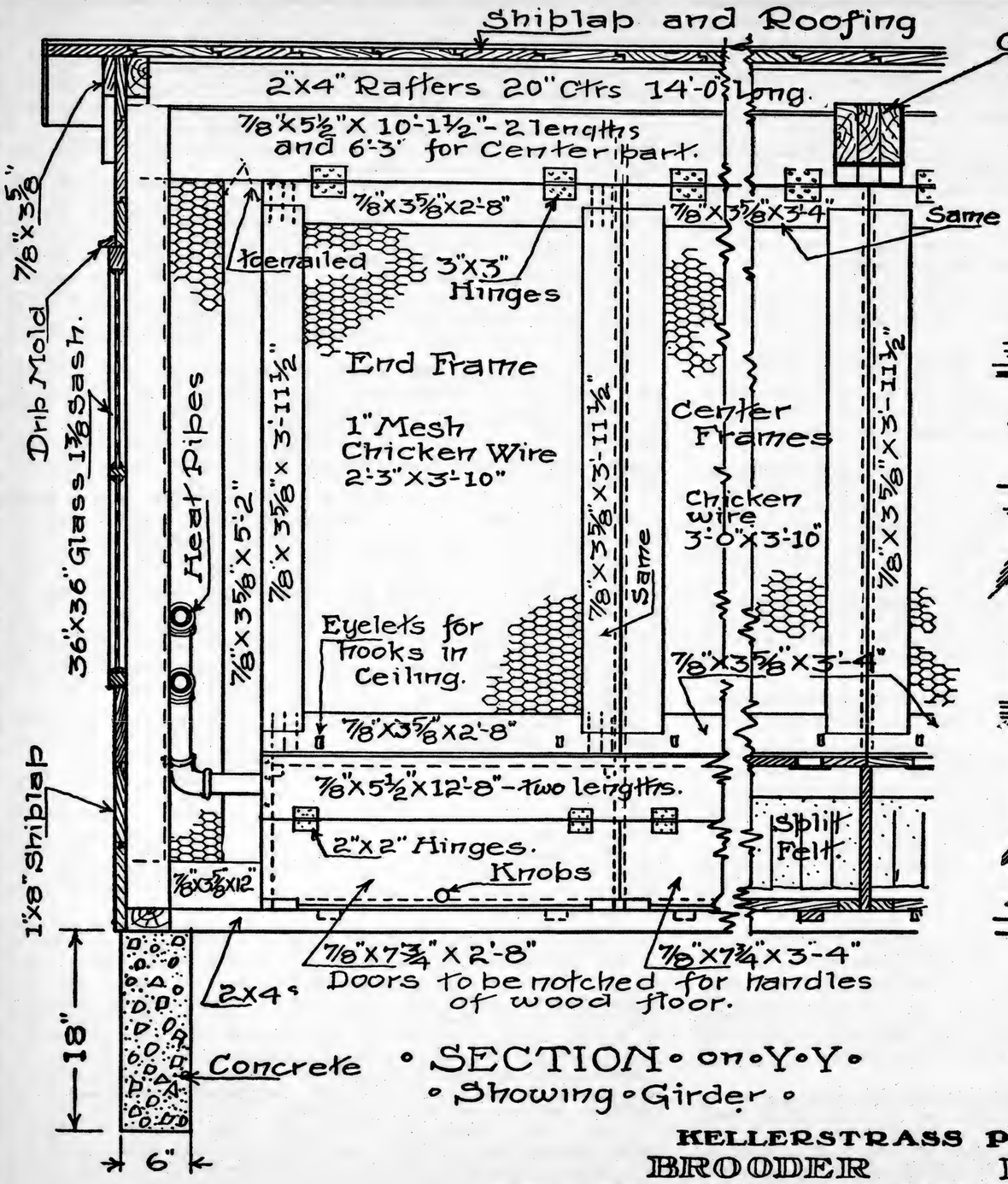
Before fitting the doors it would be well to nail on the stops or ⅞x3⅝ in. pieces on the 2x4s forming the head and side jambs for the doors, or, in other words, forming the frame for the doors. Fit these pieces tightly at the top and at the bottom—their front face is to be flush with the face of the 2x4, as indicated on the Detail, so as to form a ⅞ in. by ⅞ in. rebate. After these are nailed on, fit the doors as above stated, and hinge them, using the 16 in. strap hinges, three to each door, placing one hinge over the center of each batten. Take care in placing the hinges so they will be directly above each other and perfectly true, so they will not get wrenched off when the door is opened. After the hinges are on and the door swings all right and fits snugly in the rebates, put on the latches or barn door catches you have provided for them and that part of the work is done.

Sash: The building is all enclosed except for the sash. Secure the skylight sash for the skylights on the roof in position, and tack fast the canvas as described under "Ventilating Sky Lights," and the roof part is done.

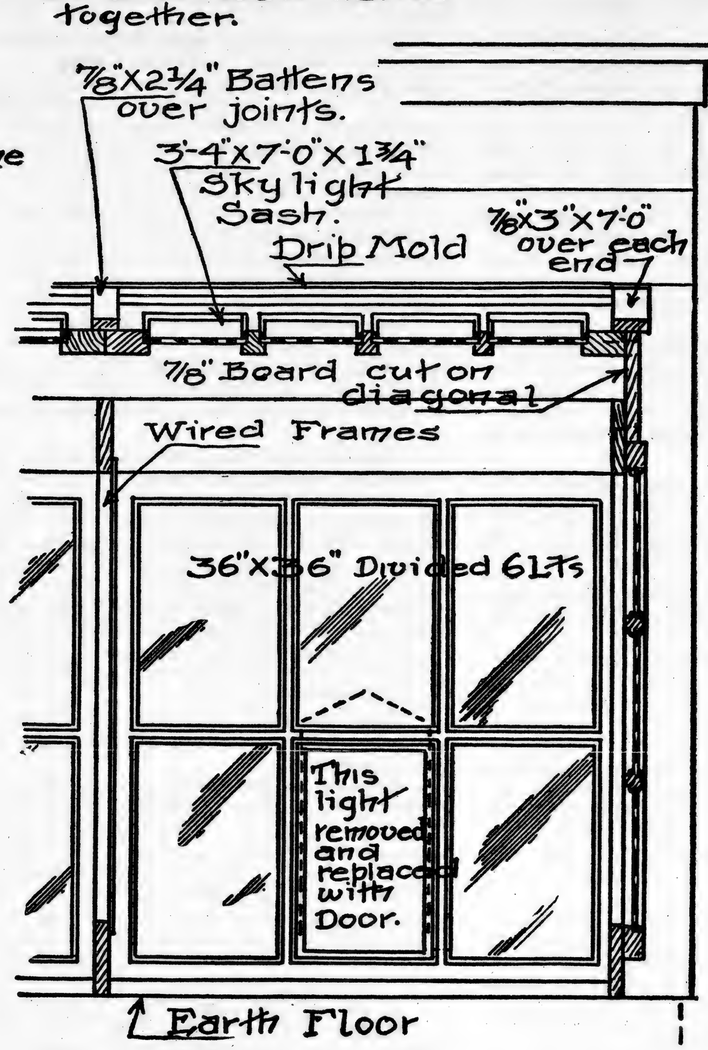
Take the small sash for the Entry and fit it in position and then hinge it, using two of the 3x3 in. hinges, and provide a small hook for it to hold it closed. The opening for this sash in the shiplap wall is to be framed or cased as directed under "Shiplap." The casing being on the inside and to go all around the sash. Nail on an additional casing, so as to form a rebate into which the sash should swing, snugly, helping to make it windproof. The Drawings state that the sash is to swing out, so build the frames and hang the sash accordingly.

Now fit the ten large sash into place for the large opening in the east side. These sash are to be 1⅜ in. thick, with 36x36 in. double strength glass, divided into six lights, as shown on the Drawings, and are to be set with the putty side out. If these sash are common sash, with check or meeting rails, plane the projecting part of the check rail off, so it will be flush with the other parts of the sash. Set the check rail down so that it will be at the bottom when the sash are placed. If the sash are specially made, have them made with 2 in. rails and stiles all around. In fitting, cut off the projecting stiles or rails, if that is not already done, and dress them so each sash reaches exactly from the center of one stud to the center of the next, except the south sash on the end, which will cover the corner stud entirely. This way of setting the sash is shown on the Detailed Plan on Plate IV. After the sash are fitted in that direction, fit them vertically, and if they have to be planed off do it in such a way that the under side of the bottom rail will slope out, thus forming a slight drip, so that the water will not run in under the sash and down the inside of the wall. This slope or bevel is indicated on the Section on Y-Y Plate VI.

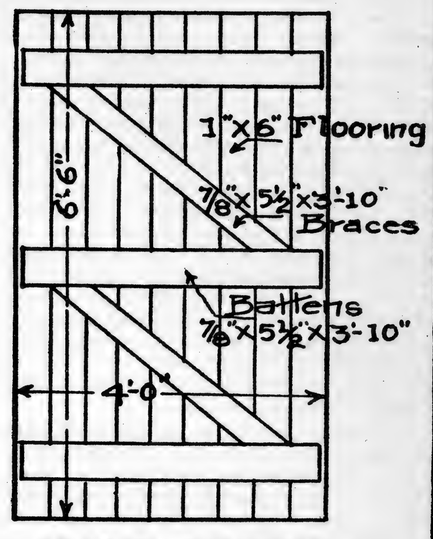
After the sash all fit snugly, fasten them securely with screws, using about six to each sash. Bore counter-sunk holes in the sash for the screws, so that there will be no split stiles or rails. In fastening the sash up, be sure and keep the top rails exactly on a straight line, and after they are all fastened



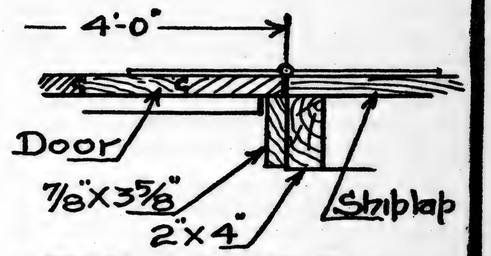
• SECTION • on • Y • Y •
• Showing • Girder •



• SECTION •
• on • Line • X • X •



• HALF SCALE •
• ELEVATION • of •
• DOOR •



• ENLARGED •
• DETAIL • of • DOOR •
• JAMB •

Scale 0ft 1ft 2ft

KELLERSTRASS PLAN OF
BROODER HOUSE
AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

PLATE • VI •

put on about 34 ft. of the drip mold over the projecting upper edge, as shown on the Section on Y-Y and indicated on other Drawings. Nail this fast securely, using 6 d. finishing nails, nailing into the shiplap, with only an occasional nail down into the sash. Now over the joints, between the sash, place some narrow strips, pieces of laths or other strips, nailing them fast. These can be done without, if you so desire, but it will make a better job to have them on. In fitting and securing any of these sash, be careful that there are no open cracks left for the wind to whistle through. Make everything tight by covering all the cracks by small strips, whether so stated in this description or not.

These side sash all on, fasten the sash across the front in place. There are eight of these sash, the same size and shape as described above, and they are to set with the check rails down, and each one is to have the bottom center light removed, to make a door or passage for the chicks. This extra pane of glass to be laid aside and will come in handy when one of the lights in some other sash gets broken. After this light has been removed, fit these in the same manner as described above for the other sash, so that the stiles of two sash will have equal bearing on the same stud, except the two outside sash, which will have to have a piece nailed onto the corner 2x4s. All as shown on the Detailed Plan, Plate IV. Screw these sash in place, with the puttied side out, in the same manner as described for the other sash, and take care that they fit tightly against the lower piece of shiplap, so as to make a straight and tight joint. When this is done, fit a vertical piece of board on each side from the outside of the sash to the corner, thus completing the front, all except the corner boards, which can now be refitted and nailed solidly in place. The corner board on the southeast corner will have to be cut so it will fit around the sash and still present a presentable appearance.

After all this is done, the exterior work on the main building is done and encloses it thoroughly, except for the openings in the front sash left by the glass being removed.

The common sash and skylight sash for the glass covered runs are to be made the same as the sash herein and heretofore described of sizes as marked on the Plans, and see the description under "Enclosed Runs" for the way of securing them.

Enclosed Runs: As long as you are working on the outside you might as well finish up all the exterior work, so that all that is exposed to the weather can be painted while the inside work is going on, but this can be done to suit your own inclination.

These closed or glass covered runs, as they are marked on the Plans, have a glass roof made up of skylight sash with glazed sash at each end and wired frames for partitions, all as shown on the Drawings. You will need nine frames, seven of which are to have wire on them, four of the 36x36 in. 6 light sash for the ends, and eight 3 ft. 4 in. by 7 ft. by 1¾ in. thick skylight sash for the roof.

The frames are to be built of 1x4 and 1x6 in. stuff, as shown on the Section through "A" and "B" on Plate V, dressed down to 3⅝ in. and 5½ in. as they are marked. Take six of the 12 ft. 1x4s and cut the 18 3 ft. 10 in. lengths necessary and nine of the 14 ft. 1x6s, to cut the eighteen 6 ft. 4 in. lengths out of, and saw all the ends square and each piece exactly the length intended. Now cut a 1⅝ in. by 5½ in. notch in each end of the 3 ft. 10 in. pieces, leaving the projecting end 2 in. wide as shown on the Drawings, and then nail these members together with 20 d. finishing nails, as shown on the Drawings. The ends of the 6 ft. 4 in. pieces, fitting into the notches in the 3 ft. 10 in. pieces. Be careful to keep them square and true. On seven of these frames thus made stretch about 6 ft. 3 in. lengths, 36 in. 1 in. mesh poultry wire, drawing it taut and securing with staples driven about 4 in. apart.

The frames completed, proceed with the preparations for setting them up. If the concrete piers have been poured as described under "Concrete" to form a bearing for the cross 2x4 at the edge of this enclosed run, use them to form a solid base for the above mentioned 2x4, but if they are not there, bed some bricks or loose rocks along under it to help keep it away from the earth and to make a solid bearing. These are to be laid so as to bring the upper face of the 2x4 on a line with the top of the concrete wall. And it will be easier to bed these after the 2x4 is laid, so get it out of two lengths of 14 ft. 2x4s and cut down to 13 ft. 4 in. lengths, each with a splice to hold them together, making a total length of 26 ft. 8 in. The splice is to be on the under side and the cross 2x4 is to be laid so that its ends will be 5 in. in from the outside edge of the foundation wall on each side, making it 4 in. inside of the frame, as shown on the Detailed Plan, and making the joint come exactly on the center line of the building. Place these 2x4s into the ground and level it up, keeping them perfectly straight and the distance from the outside of the sash to the further edge of the 2x4 is to be 6 ft. 8 in.

After this is level, and laying solidly in the ground, cut two 14 ft. 1x6s into 13 ft. 4 in. lengths, making the ends square and dressing down to 5½ in. wide for across the front of the frames at the top, as shown on the Section on Plate V. Now take one of the frames without the poultry wire on it and set it up at one end in the position shown on the Detailed Plan, Plate IV, with its outer side flush with the edge of the sash and also flush with the end of the 2x4 in the ground; after first being sure that the frame is perfectly plumb and square, toe-nail it fast to the sash and to the 2x4, holding it solidly. Set up the other end wireless frame in the same manner, toe-nailing it fast. Now put up the intermediate frames, which are covered with wire, placing them exactly 3 ft. 4 in. from center to center, so that the joints between the sash will come in the center per the Plan. Be sure these are all square and plumb and then toe-nail them solidly in place. Now nail the two 13 ft. 4 in. 1x6 or 5½ in. pieces in place, butting together exactly in the center of the center frame, with the outer ends flush with the outer side of the outside frames, and the upper edges flush with the upper edge of the frame, thus holding the frames securely.

Cut two more 14 ft. pieces of 1x6 into two 13 ft. 4 in. lengths and nail these up above the frames on the shiplap wall, to form a rest or cleat for the skylight sash, the outer ends of these pieces to come flush with the outside of the outside frame.

Now place the eight skylight sash in position, resting their upper ends on the 1x6, just put on, and the lower end on the 1x6 across the front of the frames, letting them project as they will. Place them so that the joints between them will come exactly over the center of the frame below, thus making the outer edge of the outside sash come flush with the outer side of the end frame. Screw these fast with six screws to the 1x6 in. pieces to hold them fast, boring holes through the sash and counter-sinking the screws.

Put up the sash on the ends next, placing them with the check rails together and as shown on the Drawings, and screw these fast with six screws each. Now fit in the triangular piece over the sash as shown on the Section on line X-X, Plate VI, using shiplap or other waste material. After this is nailed in place, put the drip mold across the whole front over the inner end of the skylight sash as shown on the Section on Plate V, and then put on the battens of ⅞ or thinner stuff, over the joints between the sash and over the edge of the board, over the ends, as shown on the Section X-X. If you make the strips or battens thicker than the edge of the drip mold, cope or fit them into the mold so it can be said that all is done in a workmanlike manner.

Open Runs: The ground for these, of course, was leveled when the other portions were, so that does not need to be done again. The enclosures consist of wired frames 3 ft. 2 in. high, which are Detailed on Plate VII and are built in such a way that they can easily be removed, if such should be required. There will be nine 12 ft. frames required and two 13 ft. 4 in. frames, one of which is detailed on above mentioned Plate.

For these two front frames take two 14 ft. 1x4 in. pieces and two 14 ft. 1x6 in. pieces and cut each to a length of 13 ft. 4 in. for the tops and bottoms. Cut a 12 ft. piece of 1x4 into four lengths 2 ft. 10 in. The 1x6 in. stuff is to be dressed to 5½ in. and the 1x4 in. is to be dressed to 3⅝ in. wide, as marked on the Drawings. The 13 ft. 4 in. pieces to be notched at each end, as shown on the Detail, leaving the projecting end 2 in. wide, as shown. Now take two 14 ft. lengths of 1x8 in. stuff and rip three strips 2¼ in. wide off of each of these, then take one of these strips and cut six lengths 2 ft. 4⅞ in. or a trifle over, so that they can be fitted in place and so they will not be short. These are for the dividing strips, shown on the Detail.

Now nail the outside members together, setting the short 1x4 in. pieces vertical with the ends in the notches and nail solidly, using 20 d. finishing nails, and after all the corners are nailed up and square, space the dividing pieces as marked on the Drawings and toe-nail them fast, fitting them first so that they will not spring the frame one way or the other. Nail both frames up in like manner, being sure to keep them square and straight.

For the other nine partitioning and end frames, take nine 12 ft. lengths of the 1x4 and nine 12 ft. lengths of the 1x6s, which are to be sized down to 3⅝ in. and 5½ in. respectively, and then notched at both ends the same as the top and bottom pieces of the other two frames. It will take 4½ pieces of the 12 ft. 1x4 for the 18 2 ft. 10 in. lengths, and take the remaining 2¼ in. wide strips and cut twenty-seven 2 ft. 4⅞ in. lengths for the dividing strips which are to be fitted in place. Nail these members up in the same manner as done in the front frame, and toe-nail the 2¼ in. strip in place, spacing them equal distances apart. After all are nailed up solid and square, stretch the poultry wire over them, using the 30 in. 1 in. mesh wire in about 13 ft. lengths for the front frames and about 11 ft. 6 in. lengths for the 12 ft. frames, making it tight before securing, which is to be done with small staples driven about 4 in. apart.

The eleven frames are all ready to set in place, so put up a 12 footer on one side with wire side out and 5½ in. wide board at the bottom and level it up with one end butting the end frame of the enclosed runs, and nail on a lath or other strip 3 ft. 2 in. long on each side, as indicated on the Plans on Plate IV, to hold it in place. Square it up and place one of the 13 ft. 4 in. frames across the front and nail it temporarily. Do the same on the other end, thus enclosing the space. Now set the intermediate frames up and secure to the enclosed run frames, by means of the 3 ft. 2 in. laths on each side, as shown on the Drawings, and nailing through the front frames into the end of the partition frames enough to hold them solid, and nail up the corner solidly and where the front frames butt, keeping all of them square and straight and perfectly parallel with each other, so this part will also be done in a workmanlike manner.

In the corners and in the center, and wherever else it might be needed, drive a good sized stake into the ground and nail the frames fast to it, so that any little wind that should happen along will not find it the easiest matter to lift these frames out of place.

Front Brooders and Hovers: These are the hovers and the inside runs across the front on the inside of the building, as marked on the Ground Plan, Plate III, and shown on the Drawings, and can be built next, commencing with the partitioning frames.

There will be five of these frames, built as shown on the Section through "A" and "B" on Plate V, and two that will have to be shorter on account of the girders projecting below the roof joists, and these are to have a sloping top, so as to fit to the under side of the girders. Take the measurements for these frames from the building, the length or width being the same as the other frames, but the height according to the measurements.

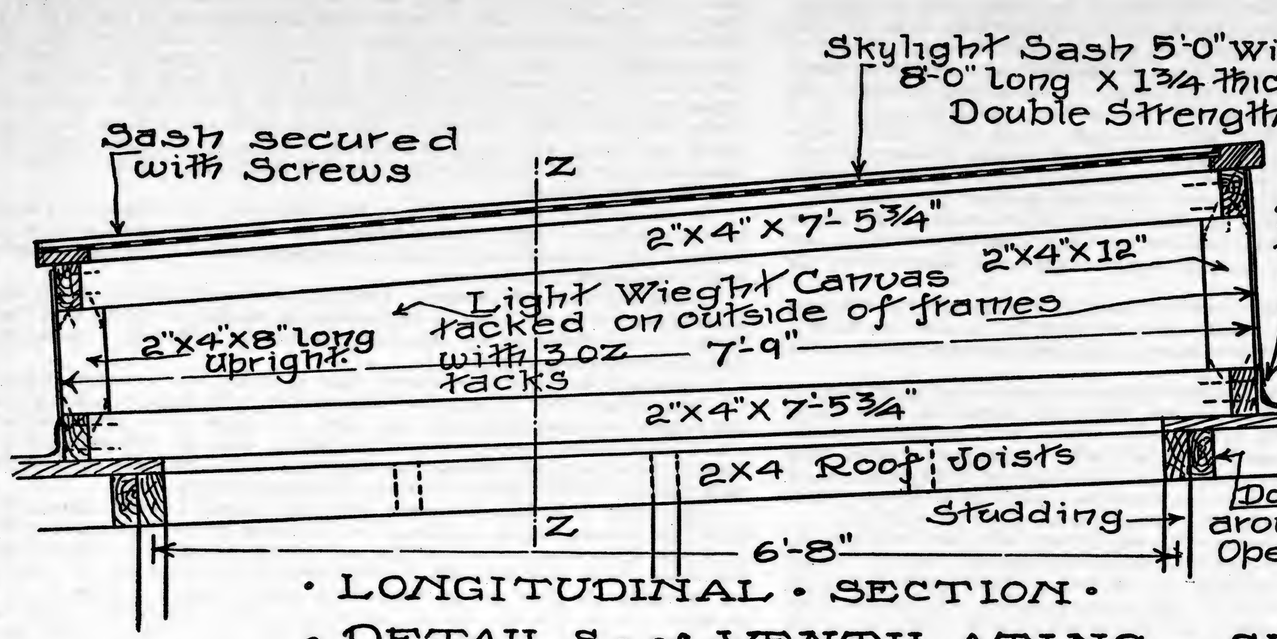
Use seven 14 ft. 1x6s and seven 12 ft. 1x4s dressed down to 5½ and 3⅝ in. for the frames, cutting ten pieces 4 ft. 4 in. long for the tops and bottoms of the straight frames out of the 1x6s, and cutting ten pieces 5 ft. 10 in. long out of the 1x4 in. pieces for the vertical members, and then use the remaining pieces for the other two frames, cutting them to proper lengths to work properly, the top and the vertical pieces are to have the proper bevels, as may be required by the sloping tops. Notch the 3⅝ in. pieces at both ends with a 1⅝x5½ in. notch, as shown, and nail all together, using 20 d. finishing nails, taking care to keep the square corners all square and straight and the sloping parts right. After they are all nailed together in a workmanlike manner, stretch the poultry wire on them, using the 60 in. wide 1 in. mesh wire in about 4 ft. 4 in. lengths, driving the staples in about 4 in. apart.

Now cut four 14 ft. 2x4s down to 13 ft. 4⅜ in. long each, and place so that they make two lengths of 2x4, reaching from one side plate to the other, and the first one is to be exactly 4 ft. 8 in. from the front sill plate and the outer side of the second 2x4 is to be 2 ft. 1 in. from the farther side of the first 2x4, all as shown on the Sections through "A" and "B." These are to serve as the base for the hovers, and when they are straight and level toe-nail them fast at the joints and to the side sill plates. Now set the seven frames you have built up in place, setting each in the center of the studding, so that they will be exactly 3 ft. 4 in. from center to center, with the bottom resting on the ground, as shown on the Drawings. Keep them all square and all perfectly parallel, toe-nailing them fast to the stud and to the cross 2x4 on the ground. And toe-nail the frames under the girders fast to them.

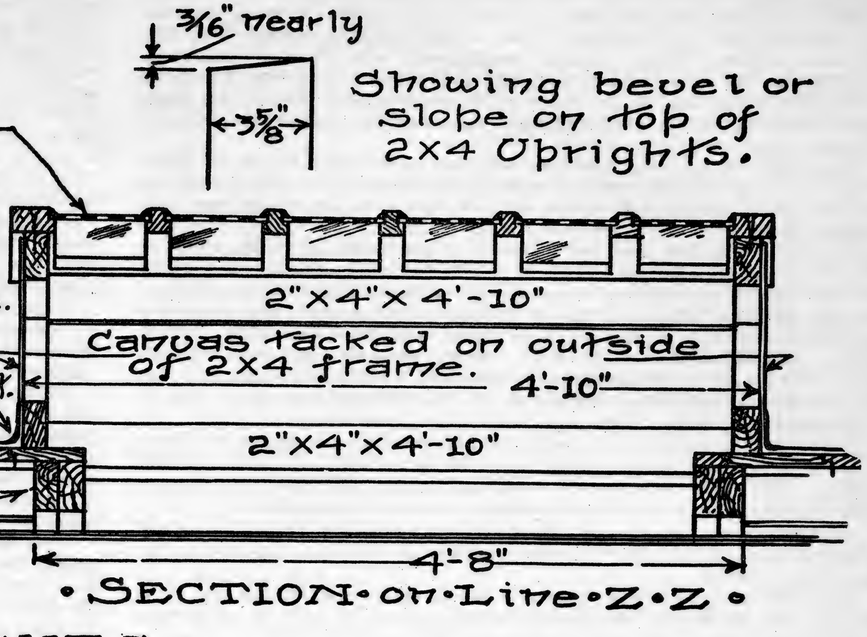
Now take three more pieces of the 14 ft. 1x6s and cut two lengths about 10 ft. 1½ in. and one length 6 ft. 3 in. for the boards across the top of the partitioning frame and between the girders and walls, as shown on the Section on Y-Y, Plate VI. Fit these in place so the large ones fit tightly to the shiplap and to the girder and the center one fits to the girders on each side, and dress the edges off so that they will be exactly flush with the bottom of the girders. Nail these in place, nailing through them into the upper edges of the frames and toe-nailing fast to the roof joist and to the girder, or, if you wish, put some blocks or cleats on the girders and shiplap at the proper points and nail into these, making all solid. Be sure and keep the frames perfectly plumb and separated exact distances apart, per the Drawings.

You can now build the hovers or make and hang the other frames above the hovers, but herein the hovers will be described next, for it will be easier to fit the other frames after they are in place. The hovers are shown in Detail on Plates IV, V and VI, giving Plans, Sections and Elevation.

Take one of the 16 ft. 1x12 in. boards and cut eight 23 in. lengths off of it, and cut another 23 in. length off of one more 16 footer, the remainder of the last 16 footer to be used for the sliding doors. These 23 in. pieces are for partitions and ends. Out of scrap pieces of ⅞ in. lumber, rip seven strips 23 in. long that will be broad enough when placed on top of the 11½ in. pieces to make the partitions 13 in. high, and make two 23 in. strips wide enough so that when placed on top of the two end pieces they will be 13¾ in. high.



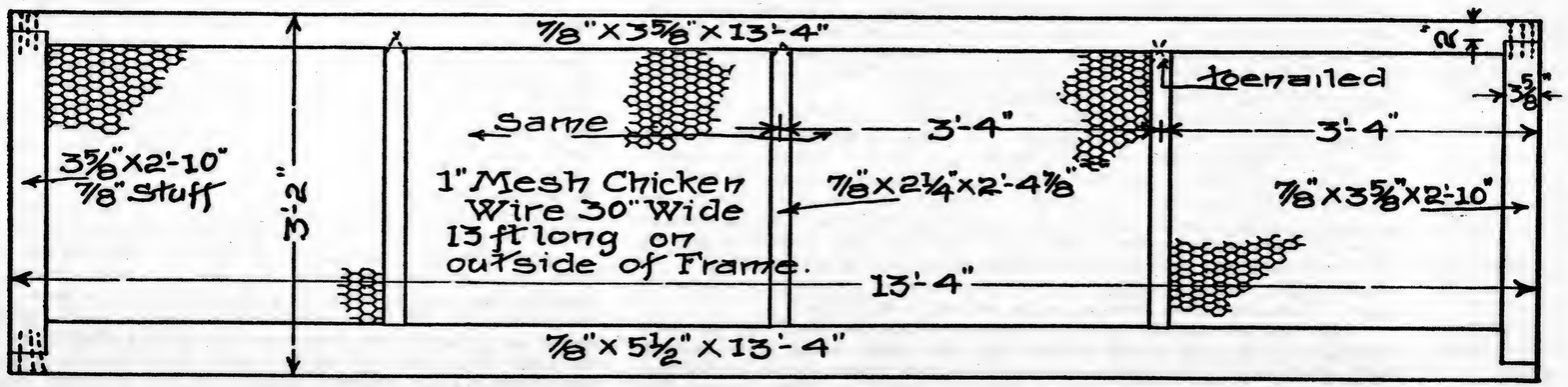
• LONGITUDINAL • SECTION •



• SECTION • on • Line • Z • Z •

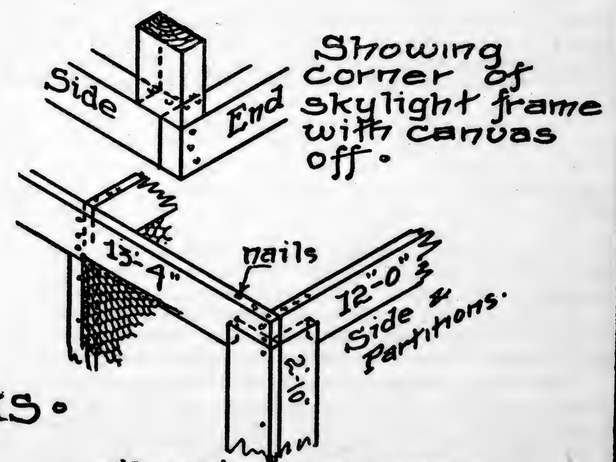
• DETAILS • of • VENTILATING • SKYLIGHTS •

Scale 0ft 1ft 2ft



• WIRED • FRAMES • across • front • of • OPEN • RUNS •

NOTE Frames used at sides and partitioning runs to be built same as above but will be only 12'-0" long.



Showing corner of Wire Frames. for Open Runs.

KELLERSTRASS PLAN OF BROODER HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

PLATE • VII •

Nail these only temporarily in place on top of the 11½ in. pieces, keeping the sides and ends flush, for later, when the heating pipes are being placed, notches will have to be cut in the partitions, as shown on the Section. The Drawings do not show this extra piece on top, but shows the full size of the partition.

After the partitions and ends are built up to the proper sizes, take two 14 ft. 1x6s and two 14 ft. 1x4s and dress them down to the sizes marked on the Drawings and cut them off to 12 ft. 8 in. lengths. Now nail these pieces and the 23 in. pieces together as indicated on the Drawings—the 3⅝ in. pieces at the front and the 5½ in. pieces at the back and the 13 in. pieces between, with the 13¾ in. piece at each end. Nail one of the 5½ in. pieces onto one of the end boards first, letting the tops of both be flush and the end of the 1x6 flush with the outer side of the end board. Next nail a 13 in. high board at the other end of the 12 ft. 8 in. length of board, setting this board so it will be ¾ of an inch above the top of the partition board, and see that the back boards project only half way over the edge of the partition. This is done to give nailing room for the other half, as this is the center of the hovers. Now nail the other 12 ft. 8 in. 5½ in. piece onto the opposite end piece, and then nail it to the center partition, making it flush with the top of the first board put on. Now nail in place the 3⅝ in. pieces across the front, this coming flush on top with the end boards, but projecting ¾ in. above the partition board. Keep this all perfectly square and build it up near the place it is to set, so it can easily be placed in position.

Now place the other partitions, placing them exactly as shown on the Drawings, the central measurements being 3 ft. 4 in. and the two outside being 2 ft. 8 in., as marked. Be sure and get these nailed in square, and their tops are to be ¾ in. below the top of the front and back boards, so the bottom will all be even. Do this all in a workmanlike manner, not nailing the filling strips on top of the partition and ends in too solidly. Now turn this up on its back and nail some 10⅛ in. long pieces that are ¾x¾ in. or ⅞x⅞ in., according to the thickness of the lumber on the front edge of the partitions and ends to make the front flush, these pieces bringing the ends of the partition flush with the face of the 1x4 nailed across there.

After these are all securely nailed in place, stretch the muslin or light nail fast to the 2x4s on the ground and nail fast to the frames through the front 1x4 in. strip. The center partition to be flush with the center frame, and if the work is done correctly all the way through, each of the partitions will be flush with the corresponding frame, the ends coming 12 in. away from the inside face of the shiplap or the outside line of the sill plates.

When this is in place and satisfactorily secured, make up the removable floors. Take one of the 14 ft. 1x8s and some other strip of lumber and cut three strips exactly 2 in. wide, if not a little wider, which cut into sixteen pieces 2 ft. 4 in. long. Out of the 5 ft. 6t in. pieces of flooring left from cutting the doors, cut nineteen lengths 2 ft. 11 in. and ten lengths 2 ft 2½ in., and then take three 12 ft. lengths of the flooring and cut eleven more 2 ft. 11 in. lengths, making a total of thirty of these and ten of the shorter. These shorter pieces for the end hovers and the others for the centrally located hovers. Now place these together in sets of five pieces each and dress the outside two pieces down so that each set will make a combined width of 2 ft. 2 in. And then nail on the 2 in. by 2 ft. 4 in. strips on each end, as shown on the plan of Hover Floor on Plate V, letting the ends project as shown. Nail solidly and countersink each nail, so that the edges of the strips can be dressed if they do not fit exactly.

When these are all nailed up, fit one in place and find the correct place to set the cleats on the under side, so that they will fit in between the 2x4s and keep the edge of the floor flush with the ends of the partitions, as shown on the Drawings. These cleats can be made out of any waste stuff that is 1½ in. wide or wider, and they will be about 17⅛ in. long and are to fit nicely down between the 2x4s, so as to hold the floors in their proper places. Nail two of these on each of the floors and fit all in place, the 3 ft. 3 in. long boards or floors going in the wide hovers and the 2 ft. 6½ in. floors in the short hovers at each end.

These all done and fitted in place in a workmanlike manner, hang the doors in place, which are to be gotten out of two 14 ft. 1x8 in. boards. Cut in place, notching them over the 2 in. projections of the floor strips and letting the center part be as wide as it will. The joints between these to come in the center of the partitions, as shown on Section on Y-Y on Plate VI, and coming flush with the outside at the ends. Put on the 2 in. by 2 in. hinges, being sure to get them true and in line, and put a knob in the center, near the bottom of each door, all as shown on the Drawings.

Now take four of the 14 ft. 1x12 in. boards and cut twelve lengths 3 ft. 4 in. and four lengths 2 ft. 7 in. for the covers. Nail a ½ in. by 1 in. strip on each of the ends, ¾ in. down from the top, and then fit the covers in place, making them 11½ in. wide with the cross joints over the center of the partitions. The shorter lengths are to go over the end hovers. After these are fitted take an extension bit and bore the two 2½ in. holes in each board as shown on the Plans, being sure to get all of them spaced exactly the same, so they will present a neat appearance. If you haven't a bit of sufficient size to make these holes, bore four small ones in the corners of a square and cut the piece between out with a keyhole saw, making a square hole with round corners. These holes are to be covered on the under side with fly-screen, which can be done any time before the chicks are put in. The ⅞x½ in. stops nailed on each side of the hovers are to be cut out of scrap lumber and may be placed in now, or you can wait until they are being put in the other brooders, so as to have more waste lumber to use. These are to be nailed on solidly with 3 d. fine nails. The split felt over the front is to be nailed on when the same is being placed on the other brooders, so that can be done at the same time. That finishes the hovers, except as noted.

Now build and hang the wire frames above the hovers, as shown on Sections Y-Y, Plate VI. These are to be built entirely of the 1x4 in. stuff, which is to be dressed down to 3⅝ in. wide. Take five pieces of the 12 ft. length of 1x4 and cut them up to fifteen pieces 3 ft. 11½ in. long and cut another piece of that length out of the 6 ft. piece of 1x4 that is remaining from a previous cutting, making sixteen pieces for the upright sides of the frames. Cut the ends perfectly square. Out of three pieces of 14 ft. 1x4s cut twelve pieces 3 ft. 4 in. long, and out of a 12 ft. piece cut four 2 ft. 8 in. lengths. These pieces are for the tops and bottoms and are to be notched at both ends with a 1⅝x3⅝ in. notch, as shown on the Drawings, making all the cuts square. Nail these members together, using 20 d. finishing nails, and keep the corners square and true, making six of the larger sized frames and two of the narrower ones, all being the same height. Cover these with 1 in. mesh poultry wire, using the 48 in. width cut into about 3 ft. lengths for the wider frames, and about 2 ft. 3 in. lengths for the two end frames.

Before hanging these it would be well to put up the pieces that serve as a frame at each side of the hovers, as shown on the Section on Y-Y. The 12 in. pieces that are to be fitted into the ends of the hovers and the wall can be gotten out of otherwise waste pieces of 1x4 in. stuff, of which there are at least two pieces that will work in good. Nail these in place, keeping the inside flush with the inside of the cross 2x4 on the ground. The four 5 ft. 2 in. vertical pieces to be gotten out of two pieces of 12 ft. 1x4s and fitted and toe-nailed in place and then secure the poultry wire on it, using scrap pieces or other pieces, and secure it on the outside or the side toward the rear. Put a strip on the back of the vertical piece next the hovers to form a rebate for the hinged wire frame.

Now place the frames in position with wired side out and hinge them, using the 3x3 in. hinges, two to each frame. Screw these fast, keeping them all perfectly on a line, so they will work right. When the frames have been fitted so they do not strike each other, place two eyelets in the bottom of each and then raise them up and screw the long hooks into one of the joists overhead, or into the shiplap, placing one hook for each eyelet in the frame. That completes closing off the interior runs that are part of the front brooders.

The sliding doors for the openings in the front sash left by removing the pane of glass are not in place yet, so they will have to be built and placed before this part of the work is done. These are detailed on Plate IV and shown on the other Plates. Take a 12 ft. 1x8 in. board and rip three pieces a trifle over 2 in. wide, so that when dressed they will be just 2 in., and plane them off. Cut two of these into sixteen pieces 1 ft. 5¾ in. long and cut the other into ten pieces 10 in. long, and then cut sixteen pieces that will be ⅞ in. deep by about ⅝ in. wide and 10 in. long, out of any pieces of waste board. Now place a 2x10 in. piece between two 17¾ in. pieces and nail fast, and then at the other end place one of the ⅝x10 in. pieces and nail it solidly, keeping it at one corner as indicated on the Drawings. Nail all the frames up in this manner.

Now take the 14 ft. piece of 1x12 left from cutting the hover partitions and rip it down to exactly 10 in. wide, so it will fit into the frames nailed up, and cut it into eight 1 ft. 8 in. lengths. Take the eight 10x20 in. pieces and bore a hole in the center near the top and then cut the corners off as indicated on the Drawings, being sure when marking these corners that they will not extend down into the frame when closed and make all of them the same pattern. Out of the 1½ in strip left off the 1x12 in. board, rip some ⅞x½ or ⅜ in. strips, and plane them down so they will be smooth and not over ⅝x⅜ in., and cut into thirty-two 16¼ in. lengths for the guides or stops for the sliding doors. Nail one of these on each side of the frames, keeping their inside faces flush with the inside of the ⅝ in. piece nailed across the top, and with the ⅝ in. face nailed against the sides, so that the outside edge will be flush with the edge of the sides.

Now fit one of the doors in each of the frames, planing it so that it will slip in and out readily, and then put the other 10 in. ⅞x⅝ in. piece in place, and then the 16¼x⅝x⅜ in. stops or guides and fit and nail all together, so that the door will not have too much sideways movement, and still slide up and down readily without sticking. Fit and nail up all the frames that way, and then put them in position in the open part of the sash and nail fast to the sills, blocking up under the frames so as to hold them perfectly straight and tight, inside the wood muntons that separate the glass. These frames should just fit inside the opening and not go through, but strike the projection of the molding, making a tight fit. Before going ahead with the making of these frames, it would be well to measure the opening so that you can make the frame and door accordingly, so you will get a good fit and a workmanlike job.

Directly above the hole in the top of the door put a pulley in the roof joist or cap plate, as shown on the Sections on Plate V, and bore a hole in the 1x6 pieces that are fitted between the girders and between the girders and walls, straight out from the pulley and opposite the hole in the door below, and straight out from this again fasten an eyelet in the nearest roof joist. Now take one end of the cord you have provided, pass it through the eyelet, then through the hole in the 1x6, then over the pulley and down to the door, tying it securely there, all as shown on the Drawings. Cut the rope so that it will be long enough to tie properly. The rope listed in the Material Bill allowing for about 12½ ft. lengths.

When this is on all the doors and they all work satisfactorily, and the other parts of the work are all done, we can call the front part of the work finished, except for painting and cutting for the heating pipes.

Brooders on Floor: The brooders on the floor are the next things to be built, so level up the ground so they will set perfectly even and proceed as directed in the following paragraphs. These brooders are indicated on the Ground Plan and Sections on Plates II and III, and are thoroughly detailed on Plate VIII. Each tier of brooders will take up a space of 8x20 ft. 1 in. and each tier contains ten brooders.

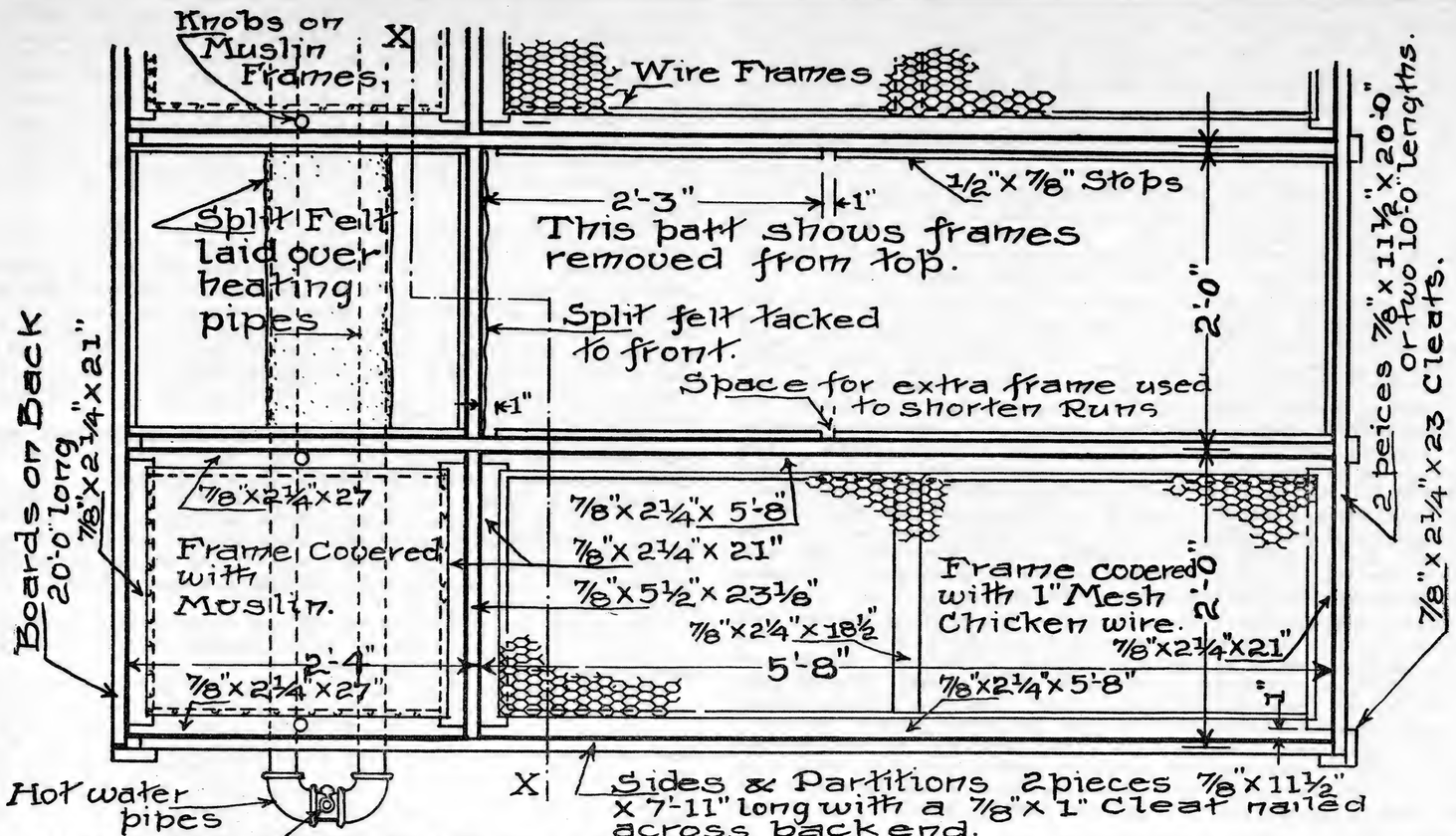
The following will describe and tell how to cut for and build one tier of brooders only, but the other tier on the opposite side will be exactly the same, except that it is reversed in plan.

Take eleven of the 16 ft. 1x12 in. boards and cut off twenty-two pieces 7 ft. 11 in. long for the partitions and ends. For the front, use two of the 20 ft. 1x12 or four 10 ft. pieces if the 20 footers cannot be obtained, and if possible get these so they will be about ¾ in. longer than 20 ft. even. For the back use a 20 ft. 1x6 and a 20 ft. piece of 1x10—get these ¾ in. long, too, if possible. The 12 in. boards to be dressed to 11½ in., the 6 in. to 5½ in. and the 10 in. to 9 in., and in cutting remember to make all cuts perfectly square and true. Now cut eleven ⅞x1 in. strips 23 in. long out of some left-over pieces of board. These are to serve as cleats on the back end of the partitions, per the Drawings.

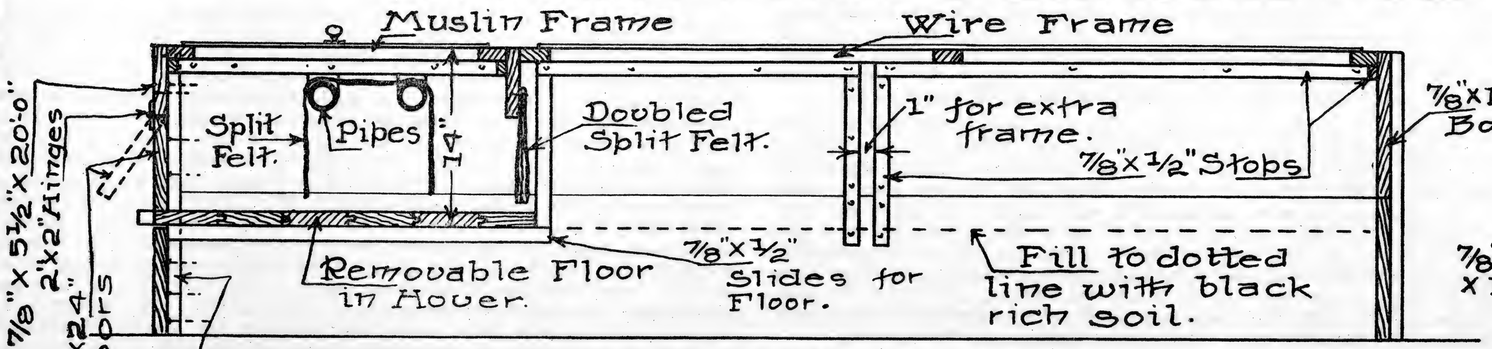
Lay the 22 7 ft. 11 in. lengths on a level place, two at a time, and nail a temporary cleat on the side near the front, keeping the ends even, then nail the ⅞x1 in. strip on the back edge, nailing it on solidly, but being careful so as not to split the strip which is set with the side flush with the sides of the board, thus making the partition 23 in. high and 8 ft. long. Nail up the eight other partitions and two ends in the same manner, and after these are all solid raise one of the ends up and nail one of the 20 ft. 1x12s fast to it, letting it extend only half way across the edge, if it is even 20 ft, or let it come flush if it has the extra ¾ in. or nearly so in length. Nail the other end on in the same manner, so that it will be exactly 20 ft. from the center of one end to the center of the other. Now nail the 9 in. board at the bottom in the back in the same manner, so the ends will be perfectly square and true. Now put the partitions up, placing them 24 in. on the centers; that is, so that it will be 24 in. from the center of one to the center of the other, and set them perfectly square and plumb and keep them perfectly parallel. Now nail the other 12 or 11½ in. board in place on the front and then nail the 5½ in. board on the back, the top of these latter coming flush with the tops of the partitions. Now nail on the cleats on the front and on the corners, as shown on the Details, making them about 2 in. wide and 23 in. long, ripping them out of a 12 ft. piece of 1x8 in. board, and then remove the temporary cleats on the side of the partitions.

There will be fifteen of these cleats, and if you cut them before the partitions are nailed up you can use them for the temporary cleats, removing one as quick as you get the other one nailed solid, this being just as good as the other way and thus saving the bother of hunting up pieces to use as temporary cleats.

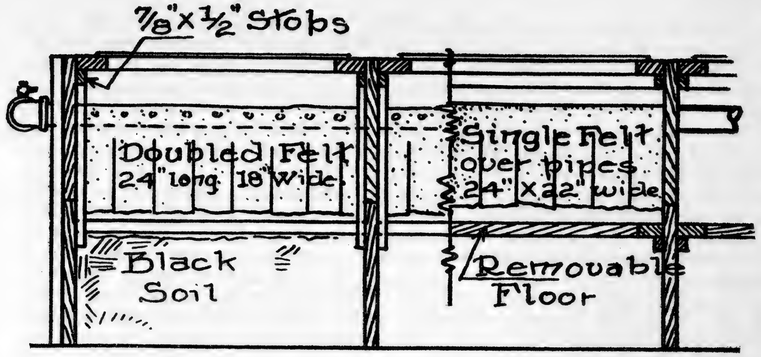
You have some pieces of 1x6 in stuff left from cutting other lengths that have not yet been used, so take enough of this and a 14 ft. 1x6 and cut ten lengths about 23¼ in. long, after having first dressed the 1x6s down to 5¼



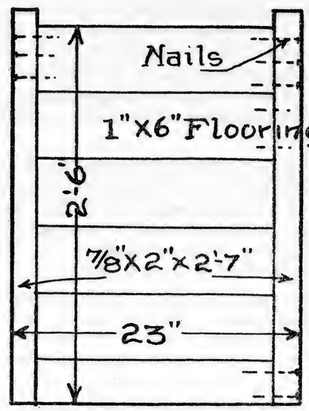
• PARTIAL • PLAN • of • BROODERS • on • FLOOR •



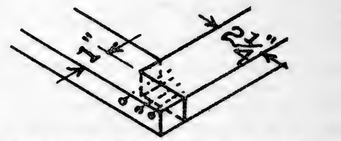
• LONGITUDINAL • SECTION •



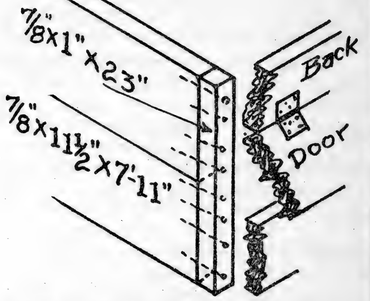
• SECTION • on • X • X •



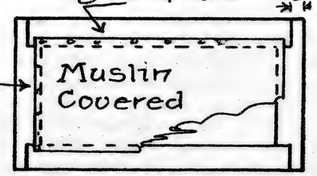
• PLAN • of • REMOVABLE • FLOOR •



• CORNER • of • FRAMES •



• SHOWING • CLEAT • ON • PARTITION • & • END • BOARDS •



• EXTRA • FRAME •

Scale 0 ft 1 ft 2 ft

KELLERSTRASS PLAN OF

BROODER HOUSE

AS IT IS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

PLATE • VIII •

in. wide. Take these pieces and fit them between the partitions, placing them 2 ft. 4 in. away from the back, as shown on the Drawings, and in fitting be careful that they do not bulge the side and partitions. Nail these fast, keeping them all straight and in a line, and the exact distance as marked on the Drawings; their top edge is to be flush with the top edge of the partition. This finishes the main body of the brooders.

You are now ready for the stops for the frames and floor, but before getting these out cut the material for the frames and then use the remaining material to the best advantage.

Take six 12 ft. 1x8 in. boards and three 14 ft. 1x8 in. boards and rip these into twenty-seven strips 2¼ in. wide, laying aside the strips off of the edge for the ½ in. stops. Cut ten of the 12 ft. lengths into twenty 5 ft. 8 in. pieces and then cut four more 12 ft. strips into twenty 2 ft. 3 in. pieces. Cut five of the 14 ft. strips into forty 21 in. lengths, and cut some more of the 14 ft. lengths into ten 18½ in. long pieces, the above pieces for the wire and canvas frames on top of the brooders. Take the pieces of 14 ft. strips remaining and cut twenty 21 in. lengths and cut two of the 12 ft. strips into twenty 12 in. lengths. These pieces for the extra frames as shown on the Drawings. The strips remaining to be laid aside for use on the removable floors.

The 5 ft. 8 in. lengths, the 2 ft. 3 in. and the 12 in. pieces are all to be notched at each end and make the notches a trifle more shallow than shown on the Drawings, so that all the frames will be exactly 24 in., if not a trifle over. Remember this in cutting the notches. After these pieces are all notched nail the frames together, using the sizes as shown on the Drawings, using the 6 d. finishing nails, and make all the corners square and in a workmanlike manner. Now build the removable floors for the hovers. Take a 14 ft. 1x8 and rip two 2⅛ in. strips off of it and lay the rest aside for a similar purpose on the other side tiers. Take these two strips and the strips left from cutting the frames and dress them down to nearly 2 in., and then cut up into 20 pieces 2 ft. 7 in. long. Now take the pieces of flooring left from previous cuttings and cut into as many 1 ft. 9 in. lengths as possible, and take five pieces of the 12 ft. flooring and cut into sufficient 1 ft. 9 in. or 21 in. lengths to make a total of 60 pieces. Now lay these pieces on the ground, six at a time, and trim the outside pieces so the combined width will be 2 ft. 6 in., as shown on the Drawings, and then nail the 2 in. 2 ft. 7 in. pieces on the edges, countersinking the nails well, so that in fitting you will not strike them with the plane, and make all secure and solid. The ends of these end cleats are to project as shown to make handles for pulling the floor out.

With the floors and frames all ready to be fitted, you are ready for the ⅞x½ in. stops, of which there will have to be about 250 lineal feet. Take scrap pieces of lumber left from other cuttings, of all lengths from 12 in. up, and a 14 ft. 1x6 and rip these into ½ in. wide strips, sawing on the ½ in. mark, and dress off the roughest part, and then cut and fit for the various places, as shown on the Details. Be sure and get these set, exactly according to the measurements given and square and true, and nail all securely in a workmanlike manner. These strips are to form the slides for the floor, the guides for the extra frames so they will slide in and out easily. Fit the removable floors so put in the ½ in. strips in the front hovers, if you have not already done so.

When these are in place, fit the frames in place, planing off the edges if necessary to make them fit snugly, and plane off the vertical edges of the extra frames so they will slide in and out easily. Fit the removable floors so they will operate right, sliding in and out readily, but at the same time fitting snugly.

Cover the 5 ft. 8 in. long frames with 1 in. mesh poultry wire, as shown, using about 5 ft. 4 in. lengths of 20 in. wide wire, if it can be secured in your community; otherwise use 24 in. and cut it down to proper width. Cover the 2 ft. 3 in. frames and the small extra frames with the light weight canvas, about 8 oz., or heavy muslin, using 20 in. lengths of the 24 in. material for the 2 ft. 3 in. frames, and using about 8x20 in. pieces for the small frames, cutting these out of the 24 in. material or out of pieces left from covering the skylight frames. Tack this fast with 2 oz. tacks about 3 in. apart. Now put two knobs or the eyelets provided, instead of the knobs, on each of the larger canvas-covered frames, and place them all in position.

You have not as yet gotten the doors on the back, so take one of the 20 ft. pieces of 1x8 and cut ten lengths 2 ft. long for the doors, which fit in place, so same will be as tight as possible, and then put on the 2x2 in. hinges, two to each door, and place one of the knobs or eyelets in the center near the bottom of each door. When these are on and the doors fit snugly you are ready to put on the split felt, and are ready to cut the notches in the partitions for the heating pipes, which will be described later under "Heating."

Now cut some of the 24 in. felt you have provided for the floor brooders and cut a 22 in. and an 18 in. length off for each hover, making the cut perfectly square, and on the 24 in. edge cut slits or splits 2½ or 3 in. apart, and 5 or 6 in. long, as shown on the Sections. Take the 18 in. pieces and double them over in the middle, then tack them fast to the cross pieces in front of the hovers, letting the bottom just touch the floor. Lay the 22 in. pieces in a pile to one side to lay over the heating pipes when they are in, as shown on the Drawings. Take the 18 in. felt and cut it up into lengths that will fit between the partitions in the front hovers; split these and double them and tack fast, the same as described above for the floor hovers.

Build the other tier of brooders in the same manner as described above, using up the remaining lumber, or, if you wish, carry the work of building it along at the same time as you do the one described, doubling the quantities stated, thus completing both at the same time. After this is all done the brooders, both floor and front, are ready to be creosoted as described under "Painting."

Miscellaneous: The building is now ready for painting and whitewashing, except for building the shelf in the Entry as described under "Entry," for which use any remaining lumber, and putting up the rail around the boiler pit and any other little odd jobs that are indicated on the Drawings, but not mentioned in this description.

The rail around the boiler pit is to be made of 2x4s, of which there are enough left for this purpose, and it is shown on the Longitudinal Section. It will take about a 10 ft. 6 in. and a 4 ft. length for the rail and a 2 ft. 8 in. length for the post. Plane all the rough edges off and round the corners and then fit in place, making the rails about 2 ft. 8 in. or a little over in height. Notch the pieces around the columns, making a tight fit and nailing securely, and if you do not get it tight enough to keep it from slipping down, place a stick on the inner side of the column to hold it. Secure the wall end to a block nailed on to the shiplap and hold the free end near the steps up, with the piece cut for the post bracing it so as to make a good, solid job.

Painting: When the woodwork is thoroughly dry, proceed and paint the exterior with lead and oil paint, painting all parts that are in any way exposed to the weather, including the under side of the eaves and top and under side of the skylight sash, and the wire frames of the front runs and the inside as well as the outside of the outside door and all other places exposed on the exterior, giving the work at least two coats, allowing about a week between coats. This will make a good job.

You can use ready mixed paint or can mix your own, as you wish. For mixing your own paint use paste white lead and pure boiled linseed oil, and if you want it to dry fast use a little turpentine or dryer, which would be better, but do not put too much of either in. A little zinc white, using one part zinc white to two or three parts of white lead, makes an excellent paint, and you can use that instead of white lead alone if you so wish. If you want to tint the paint add colored pigments of the color you desire in sufficient quantities to make the proper shade. White is a good color for this Brooder House, although it will match nicer with your other farm buildings if painted the same color as they are.

The priming coat of paint may be thinned out and brush this out well, leaving no bubbles or thick places to blister and peel off. The second coat should be thicker and not thinned. It is desirable to brush on all the paint with the grain of the wood. If you paint the columns on the interior with oil paint, do not thin either coat.

The entire interior, except the brooders on the floor, and all parts of the hovers, across the front and perhaps the rail around the boiler pit and the pipe columns, are to be whitewashed, filling all the cracks and crannies thoroughly, making the inside perfectly white, including the roof and the Entry. Mix the lime provided for this with water, giving it time to slake, making it about the consistency of thin cream, and then brush it on with a whitewash brush.

The floor brooders and the front hovers are to be coated with crude carbolic acid or creosote and put on enough to thoroughly saturate the wood.

Finish: This is only the finish of the mason's, carpenter's and painter's work, for the heating plant, which is the life of the brooder house, is not in, but will be described in the following under "Heating."

When the crude carbolic acid or creosote is thoroughly dry in the floor brooders, get some rich black soil, or other good rich, fertile earth, and fill in to the height shown on the Sections on Plate VIII. And fill the front interior runs with the same kind of earth to the height shown on the Section on Plate V.

After the paint and whitewash is thoroughly dry and the heating plant in working order, spread cut alfalfa grass, hay, or other litter over these earth floors of the runs and the Brooder House is ready to receive the chicks from immediately after they are hatched, until they are strong enough to withstand the inclemencies of the weather and rustle about for themselves.

If this House is built in an exceedingly cold climate, and it is found found that you cannot keep the building at the correct temperature, which is 70 degrees above zero in all weather, cover the outside of the shiplap with a layer of asbestos or other good heavy non-conducting or weatherproof building paper, placing it on in vertical strips so the battens of laths or other strips will not catch the water. While this paper is being put on, remove the eave strips, corner boards and drip molds and replace them after the paper is on, making everything secure. This will add considerable warmth to your building.

The Entry is built in, for the express purpose of keeping the cold outside winds from blowing directly in on the wee chicks in the floor brooders when the door is opened, thus protecting them and excluding all unnecessary draughts.

If you wish some of the outside windows can be hinged to give additional ventilation in mild weather, but this can easily be done by removing the screws in one of the side sash, and lifting same out of place.

HEATING.

The ideal heating system for the Brooder House is **Hot Water,** and that is the system shown on the Drawings and Plan on Plate III and described in the following paragraphs. This system consists of circulating hot water through the pipes and radiators. The boiler, pipes and radiators are completely filled with water. The water in the boiler when heated rises and circulates through the pipes and radiators, thus imparting heat to the pipes and radiators, which in turn warm the air in the room, and as the water gets cooler and heavier, it passes down through the return pipes to the boiler, where it is again heated. The advantage hot water has over steam is that it does not make the pipes too hot. Exceedingly hot pipes, as steam pipes usually are, would not do in the hovers of the brooders. The hot water makes a milder and pleasanter heat. For this reason it is also recognized as the best heating medium for our homes.

The space herein will not allow of a full explanation of the operation and of all of the workings of this heating system, but the following paragraphs will touch on each item necessary so that you can proceed intelligently with the installation thereof.

Doubtless the best method, if you have no previous knowledge of steam and hot water fitting, would be to employ an experienced hot water fitter to help you install the plant. And if you wish and are so located that you can, you could let the whole, work, material and all, by contract to some reliable plumbing and heating man or firm, and thus, guaranteeing for yourself a plant that will be entirely satisfactory, but in lieu of these, proceed as directed herein and as shown on the Drawings, and using your good, common sense, and you can install your plant yourself, with the assistance of a couple helpers, to your own pride and satisfaction.

Before giving a list or bill of the pipes, fittings, boiler, etc., entering into the construction, the following will be a short resume of the several different items and materials, making an attempt to impart some information in regard to them. Illustrations of all these things can be found in the catalogues of dealers in steam and hot water fitters' supplies.

Boiler: There are many varieties of hot water boilers on the market, the most of them being made of cast iron and they are in two classes—the square, sectional boilers and the round boilers. The sections in the square boilers are set vertical and those in the round boilers, which are also sectional, are set horizontally, one section fitting on top of the other. The selection of the boiler will be left to you, so get prices on several, and also find out the weak and strong points in each, and then choose the one that strikes you as being best and most appropriate for this work. The boiler indicated on the Plan is a square, sectional, cast-iron boiler, and is to have a rated capacity of about 600 sq. ft. of radiation, (that determines the size). This size may be a little large, if you are located in a mild climate, but will not prove too large in a rigorous climate. If the wintry winds do not get too cold in your locality, a 500 sq. ft. rated capacity boiler will be ample to take care of the radiation. Radiation, in this meaning, means radiators, pipes and all. It is customary to cover the boiler with a coating of asbestos plaster, to keep the heat inside the boiler, but that may not be found necessary here for the heat rising from the boiler will help warm the building as efficiently as if it went into the pipes. The kind of boiler selected, might make a difference in the run of the pipes at the boiler, and it will if a round boiler is selected, but in any case, have the people from whom you buy the boiler, make a sketch or plan of the piping, so as to connect properly with the balance of the piping. See further in the List of Materials.

Smoke Pipe: The smoke pipe from the boiler is to be made of 20

guage galvanized sheet iron, and is to be provided with an air chamber and plate where it passes through the roof, and ought to have a damper near the lower end, which should have a fastener to hold it in position. The size will vary with the style and size of the boiler, but will probably be about 8 in. in diameter and 14 or 16 ft. long. It is to set vertical on the smoke hood of the boiler and run through the roof, and be sure and get a water tight job at that point.

Piping. The pipes formerly used for conveying steam and hot water were made entirely of wrought iron, but now the term "wrought iron pipe" means merchant pipe, which is generally made of soft steel, distinguishing it from cast iron pipe. If you wish real wrought iron pipe, which is more expensive but also more durable, call for "genuine wrought iron pipe." Each length of pipe as sold is provided with a coupling on one end and has a thread cut on the other. The pipe lines are all shown on the Plans and are run in pairs, one is a circulating main or flow pipe, and the other the return pipe. The flow pipes are attached to the top of the boiler and the returns near the bottom, the flow pipe sloping up from the boiler and returns running parallel with the flow pipe, sloping back toward the boiler. At the highest point in each line of pipe, put an air valve and at the lowest point of the pipe system put a draw-off cock, desirable on the return near the boiler, so the system can be emptied at any time. The apparatus should be kept full of water, when not in use during the summer. This prevents corrosion of the pipes, etc. The apparatus is filled by connecting a water supply pipe or hose with a valve on one of the returns or the connection is made to the side of the expansion tank, which is probably the best in this case.

Fittings: This will only mention the fittings that will be used in this system, there being otherwise too many to mention. The ordinary pipe coupling has already been mentioned under "Piping," and is simply a collar of the same material as the pipe with threads inside and connections are made by screwing the threaded end of one pipe into the couplings on the other. Reducing couplings or fittings are also made for uniting pipes of different sizes. For connecting two lengths of pipe so they can be connected or disconnected at that point without interfering with the other joints (by turning one of the lengths of pipe), lip and flange unions are used. The lip unions for 2 in. pipe and under and flange unions for larger pipe. The lip unions consist of three pieces, two of these screw onto the ends of the pipe, and are then drawn together by the third which holds one with the lip or projection and screws on to the other piece. The flange unions are in two parts, and these are first screwed onto the ends of the pipe and then bolted together. A ring of packing must be placed between these to make a tight joint. To make turns in the pipe, elbows are used of which there are a number of styles, including reducing elbows. This system will only require 90 degree elbows or ells, which turn at right angles, and 45 degree ells, which turn the pipes that many degrees away from a straight line. Then there are tees, crosses, reducing tees, of which there are several to be used on this job, etc., in a great variety of shapes and sizes. Descriptions of these may be found in any Steam Fitters' Catalogue. Plugs are used for closing the end of a fitting, and caps for screwing over the end of a pipe. For use in heating systems, cast iron fittings are the best, so use them in this work.

Valves: The valves on the main or flow pipes, shown on the Drawings are to be gate valves. In these valves the disc which closes the opening is at right angles to the pipe. These are made with rising and non-rising stems and plated bodies and rough unplated bodies. Those with rough body are all right for this work, the valves with the non-rising stems are the best, but also most expensive. Either will do for this work. These valves can be dispensed with if you desire, but they are a nice thing to help control the heat in the brooder hovers. The return pipes should also have valves, but on account of expense they are left out of this plant. The radiator valves ought to be quick opening hot water valves, of which there are several good kinds on the market. The air valves are small and are made to operate with a key or a wood wheel and some are made with a turned plug with the hole bored through it. The size of these is about ⅛ in., screwing into a hole of that size. Select any of the many kinds on the market and put on at every high point in the system as before stated. A cock operates by turning a plug which has a hole bored through it. When this plug is turned so the hole is in line with the pipe, the water flows through, and when turned back it is closed. Place one of these in the lowest part of the system or use some other good valve there. One of these is also to be placed in the inlet pipe in the side of the tank, or another valve may be used as stated above.

Expansion Tank: These are made of heavy galvanized sheet steel and the one to be used in this heating plant will be about 12 in. in diameter and about 30 in. high, or about a 15 gal. tank. They set upright and the bottom is sunk inwards and the top rounded outwards. They are tapped at the top and bottom for the vent and expansion pipes and on the side about three inches up from the bottom for a feed pipe and some have a guage glass at the side, but this may be gotten without the glass, although a glass is much better. The expansion tank is used to take care of the increase in the volume of the water due to expansion caused by heat, and is connected with the outside air by a vent pipe, which in this plant is to go out through the wall with an overflow pipe taken off of it, going back toward the drain in pit. This tank is to set about 2 ft. above the highest part of the radiator, and is to be connected at the bottom with a Honeywell Generator, which is to be described later and which is in turn connected to the main pipes or outlet pipe near the boiler. This connecting pipe is called the "Expansion Pipe," and if the generator is not used, should be taken off of one of the vertical pipes at the end of the pipe line, thus changing the location of the tank. Take good care that the water in the tank does not freeze at any time, and that the vent pipe does not get closed up by frost. Keep about 3 in. of water in the tank at all times.

Honeywell Generator: This heat generator is used to quicken the circulation of the water in the system, thus giving out more heat. It is connected with the expansion pipe on one side and to the expansion tank at the top, connecting with the bottom of the tank, as stated above. This generator operates by sealing the circuit, which permits of a pressure of about 10 lbs. being raised in the system, at which point it relieves itself by the operation of the mercury seal. It is automatic and is sold under the strongest guarantee and cannot get out of order. Size No. 1, or the smallest one made is ample for this plant. If you are located in a mild climate, this generator can be left out, connecting the expansion tank as stated above, but where the weather gets very cold in the winter, it would be well to install complete, as herein described. The extra cost of a generator being very slight and would be nothing in comparison to having your chicks freeze to death.

Radiator: Steam and hot water radiators have the same exterior appearance, but have a slight difference in the interior. There are many varieties of shapes and sizes, but nearly all are made of cast iron, although recently there has been a pressed sheet steel radiator put on the market which is very good. The size and style of the radiator for this plant is to be a cast iron 3 column, 38 in. high radiator, with a capacity of 100 sq. ft. radiation, which will make it have twenty sections and be about fifty inches long. It is to be tapped at the bottom at each end and be connected to the flow and return pipe as shown on the Plan with a valve on each connection, so it can be cut off if the building gets too warm. The radiator is to be tapped for an air valve in the top, at one end.

List: The above mentions the several items and the following list of pipes and fittings will take up each pipe line from the time it leaves at or near the boiler until it returns to same, so by following the list you can get each joint as shown on the Plans and in their correct place. The other items will also be mentioned in order, so they can be installed as you go along.

In ordering this material it would be well to send a set of the plans with your order, and have them check every pipe length and every fitting, so that you can be sure that all are exact. Instead of sending them the plans, if the building is up, it would be a good idea to have some one take the measurements from the building, thus being absolutely sure all is correct.

The pipe measurements below are based on a vertical sectional boiler that will be 3 ft. 6½ in. from the floor to the highest point, where the supply outlets (b) will be screwed in, and the distance from the center of one of the outlets to the center of the other is 12½ in. and the distance from the floor to the center of the return connection, 16 in. And the distance from center to center of these connections, 16½ in. The measurements on all the different boilers vary, so porportion the pipes accordingly. The above measurements will make the top of the boiler 11½ in. below the main floor or top of concrete pit walls. All piping to be threaded properly.

The first thing on the list is the boiler and then the different pipe lines and the other part of the apparatus. In the list you will also find notes in regard to measurements.

The list follows:

Cast iron Sectional Boiler: (a) 600 sq. ft. rated capacity.
This is to have an expansion thermometer
Firing tools for above, consisting of poker, scraper, or slice-bar, and fine brush and handle.
Smoke pipe: (d) Eight inch or as may be required by boiler 14 or 16 ft. long, with doubled pipe and roof plate.
Piping, etc., as follows:
Supplies out of Boiler—(b):
3 in. pipe, 6 in. long, f & j connections, set vertical.
3x3 in. ell
3 in. pipe, 4 in. long, f & j connections, set horizontal.
3x3 in. ell
3 in. pipe, 3 in. long, f & j connections, slope up.
3x1½x1½ in. tee, f & j connections
3 in. pipe, 3 in. long, k & n connections, set vertical.
3x1x3 in. tee, k & n and expansion pipe.
3 in. pipe, 10 in. long, set horizontal.
3x2x1½ in. tee, k & n connections.
Pipe Line—(f):
Flow (f) 1½ in. pipe, 6 in. long, set sloping upward, connecting with tee.
1½ in. gate valve.
1½ in. pipe, 2 ft. 3 in. long.
1½x1½ in. ell
(f) 1½ in. pipe, 37 ft. 1 in. long.
1½x1½ in. ell.
(g) 1½ in. pipe, 26 ft. 3½ in. long.
1½x1½ in. ell.
1½ in. pipe, 16 in. long, set on 45 degree angle.
1½x1½ in. 45 degree ell.
(h) 1½ in. pipe, 28 ft. 8 in. long.
Lip Union.
1½ in. pipe, 6 in. long.
1½x1½x1½ in. tee.
(i) 1½ in. pipe, 2 ft. long, set vertical above flow pipe.
Cap tapped ⅛ in. for air valve.
Air valve.
1½ in. pipe, 6 in. long, set vertical below to return.
1½x1½ in. ell.
1½ in. pipe, 6 in. long.
Lip Union.
Return (h) 1½ in. pipe, 28 ft. 8 in. long, under flow pipe.
1½x1½ in. 45 degree ell.
1½ in. pipe, 4½ in. long, set on 45 degree angle.
1½x1½ in. ell.
(g) 1½ in. pipe, 26 ft. long to run on level with flow.
1½x1½ in. 45 ell.
1½ in. pipe, 7 in. long to 45 toward rear and downwards.
1½x1½ in. 45 degree ell.
(f) 1½ in. pipe, 37 ft. 3 in. long, to run under flow.
1½x1½ in. ell.
1½ in. pipe 2 ft. 10½ in. long.
1½x1½ in. ell.
1½ in. pipe, 2 ft. 1 in. long, set vertical.
1½x1½ in. ell.
1½ in. pipe, 3 in. long, horizontal, connecting with tee return to boiler.
Pipe Line—(j):
Flow (j) 1½in. pipe, 18 in. long, sloping upwards, connecting with sup. tee.
1½ in. gate valve.
1½ in. pipe, 3 ft. 8 in. long.
1½x1½ in. ell.
(j) 1½ in. pipe, 22 ft. 4 in. long.
1½ in. Lip Union.
1½ in. pipe, 6 in. long.
1½x1½x1½ in. tee.
(i) 1½ in. pipe, 24 in. long, set vertical above flow pipe.
1½ in. Cap, tapped for ⅛ in. air valve.
Air valve.
1½ in. pipe, 6 in. long, set vertical below flow pipe.
1½x1½ in. ell.
1½ in. pipe, 6 in. long.
1½ in. Lip Union.
Return (j) 1½ in. pipe 25 ft. 5 in. long, returning under flow.
1½x1½ in. ell.
1½ in. pipe, 3 ft. 9½ in. long.
1½x1½ in. ell.
1½ in. pipe, 2 ft. 11 in. long.
1½x1½ in. ell.
1½ in. pipe, 2 ft. long, set vertical down to return tee.
Pipe Line—(n):
(n) 1½ in. pipe, 14 in. long, sloping up from reducing tee.
1½x1½ in. ell.
1½ in. pipe, 6 in. long.
1½ in. gate valve.
Flow 1½ in. pipe, 24 in. long.
1½ in. Lip Union.
(n) 1½ in. pipe, 27 ft. long through hovers.
1½x1½ in. ell.
1½ in. pipe, 6 in. long, tapped ⅛ in. for air valves, to have right and left threads.
Air valve.

1½x1½ in. ell, left threads on one side for 6 in. pipe above.
Return (n) 1½ in. pipe, 27 ft. long.
1½ in. lip union.
1½ in. pipe, 3 ft. 1½ in. long.
1½x1½ in. 45 degree ell.
1½ in. pipe, 2¼ in. long, set on diagonal.
1½x1½ in. ell.
1½ in. pipe, 4 ft. long, set vertical to return tee to boiler.

Pipe Line—(k):
Flow (k) 2 in. pipe, 6 in. long, set horizontal, connecting with reducing tee.
2 in. gate valve.
2 in. pipe, 12 in. long.
2 in. lip joint.
2 in. pipe, 4 ft. long.
2x2 in. ell.
(k) 2 in. pipe, 7 ft. 8 in. long, sloping up.
2x2 in. ell.
2 in. pipe, 9 ft., 2 in. long.
2x1½x1½ in. tee.
1½ in. pipe, 10 in. long, connecting to radiator valve.
1½ in. hot water Q. O. Rad. valves, with union.
(p) 100 sq. ft. radiator, 3 col. 38 in., tapped at bottom, both ends.
⅛ in. air valve at top.
1½ in. hot water valve with union, or this may be union and ell.
(l) 1½ in. pipe, 14 ft. 4 in. long, connected to reducing tee.
1½x1½ in. ell.
1½ in. pipe, 10 ft., 2 in. long.
1½x1½ in. ell.
1½ in. pipe, 4 in. long, set vertical.
1½x1½ in. ell.
(m) 1½ in. pipe, 21 ft. long, through hover.
1½x1½ in. ell.
1½ in. pipe, 6 in. long, tapped ⅛ in. for air valve, with right and left threads.
Air valve.
1½x1½ in. ell, threaded left one side for left thread of pipe above.
Return (m) 1½ in. pipe, 21 ft. long.
1½x1½ in. ell.
1½ in. pipe, 7 in. long, set vertical to drop pipe down.
1½x1½ in. ell.
1½ in. pipe, 10 ft. 10 in. long, under flow pipe.
1½x1½ in. ell.
(l) 1½ pipe, 9 ft. 2 in. long.
1½x2x1½ in. tee.
1½ in. pipe, 13½ in. long, sloping up to rad. valve.
(k) 2 in. pipe, 14 ft., 4 in. long, from tee.
2x2 in. ell.
2 in. pipe, 7 ft. 8 in. long, sloping down.
2x2 in. ell.
2 in. pipe, 4 ft. long.
2 in. lip joint.
2 in. pipe, 9½ in. long.
2x2 in. ell.
2 in. pipe, 22½ in. long.
2x2 in. ell.
2 in. pipe, 16 in. long, set vertical.
2x2 in. ell.
2 in. pipe, 12 in. long, connecting to return reducing tee.

Return connection to boiler:
1½x3x1½ in. tee, f & j, piping.
3 in. pipe, 3 in. long, set vertical.
3x3 in. ell.
3 in. pipe, 3 in. long, screwed into boiler.
1½x3x2 in. tee, n. and k. piping.
3 in. pipe, 3 in. long, set vertical.
3x3 in. ell.
3 in. pipe, 3 in. long, tapped for drawoff cock.
⅜ in. drawoff cock.

Expansion piping (c):
(c) 1 in. pipe, 20 in. long, set vertical, screw into front supply tee.
1x1 in. ell.
1 in. pipe, 3 ft. 8 in. long, horizontal to (c).
1 in. lip union.
1 in. pipe, 6 in. long, connected to generator.
Honeywell Heat Generator, small size.
1 in. pipe, 5 in. long, connect to top of generator.
1 in. lip union.
1 in. pipe, 5 in. long, connect to bottom of tank.
(c) Expansion tank, 12 in., 15 gal.
¾ in. pipe, 1½ in. long, horizontal on side of tank 3 in. from bottom.
¾ in. valve or cock for same.
¾ in. pipe, 1½ in. long, with union on end.
¾ in. union that will take a rubber hose connection.
1 in. pipe, 6 in. long, vertical out of top of tank.
1x¾x1 in. tee.
1 in. pipe, 2 ft. long, horizontal overflow, screwed into tee.
1x1 in. ell.
1 in. pipe, 6 ft. long, set vertical.
1x1 in. ell.
1 in. pipe, 2 ft. horizontal.
1x1 in. ell.
1 in. pipe, 3 ft. long, turned down into boiler pit.
¾ in. pipe, 12 in. long, vertical out of tee for vent.
¾x¾ in. ell.
¾ in. pipe, 24 in. long, horizontally out through wall.
¾ in. lip union at end or hose union.

Note.—All long lengths of pipe may be in several pieces if coupled up correctly.

The above list takes every pipe and fitting in rotation so that you will have no trouble in selecting the proper pipe and proper fitting for use in the proper place. The totals of the pipes and fittings are as follows:

3½	lin. ft. of 3 in. pipe.	3	1½ gate valves.
53½	lin. ft. of 2 in. pipe.	1	2 in. gate valve.
438	lin. ft. of 1½ in. pipe.	2	1½ in. Rad. valves.
21½	lin. ft. of 1 in. pipe.	5	⅛ in. air valves.
3	lin. ft. of ¾ in. pipe.	1	¾ in. valve.
4	3 x3 in. ells.	1	⅜ in. drawoff cock.
7	2 x2 in. ells.	1	expansion tank, 15 gal.
25	1½x1½ in. ells.	1	heat generator, No. 1.
4	1x1 in. ells.	1	radiator, 100 sq. ft.
1	¾x ¾ in. ells.	1	hot water boiler, 600 sq. ft.
5	1½x1½ 45 degree ells.	1	set firing tools.
2	3 x1½x1½ in. tees.	1	smokestack.
1	3 x1 x3 in. tees.	½	gal. paint.
1	3 x2 x1½ in. tees.	Some Red Lead or pipe joint cement.	
1	3 x1½x2 in. tees.		
2	2 x1½x1½ in. tees.		
2	1½x1½x1½ in. tees.		
1	1 x ¾x1 in. tee.		
2	2 in. lip unions.		
5	1½ in. lip unions.		
2	1 in. lip unions.		
2	¾ in. lip unions.		
2	1½ in. caps.		

Note.—The first two measurements of the tees are those in a straight line, the last measurement indicating the size of the pipe branching off at right angles.

Installation: It will be better to order the pipes all cut and threaded as per above list, and the corrected list of boiler connections, which will vary some with every boiler, so you will not need any expensive fitters' tools, but only a common large sized monkey-wrench and a pipe wrench or two that will take in the 3 in. pipe as well as the ¾ in. pipes, and the necessary nipple wrench for installing the boiler. If you do your own pipe cutting you will need pipe cutting and threading devices, as well as a pipe vice and other tools.

If you have constructed the floor of the boiler pit right, you can proceed to erect your boiler, but if it is crooked and unlevel, level it up, using cement top coating; for all the boilers require to be set level and true, and all require a good, firm base to rest on.

When this is level, proceed to assemble the sections of the boiler as directed in the Manufacturers' directions, which will come with each boiler. Place the boiler, if it is a square sectional one, as shown on the Drawings, so that its center will be 2 ft. away from the north wall of the pit and 2 ft. 6 in. from the west wall, which locates it as required to make the pipe lengths herein, work out correctly. Remember to follow the Manufacturers' directions exactly and you will have no trouble when starting up the plant. The Manufacturers also furnish directions describing how to run their boiler to get the best satisfaction, so that will not be mentioned herein.

Be sure and cement the joints between the sections and between the base and foundation, so that all will be air-proof, for all the air for combustion should enter through the draught door and not through any chinks or open spaces between the base and foundation or between the sections.

When setting up the smoke pipe or stack be sure to get the connection to the boiler air-tight for the same reason as stated above. Where it passes through the roof, place the piece of double pipe for air chamber, and there will be no danger of setting the roof on fire. Place the roof plate over and under the roofing in such a way that all will be water-tight and cement and tack the roofing down securely. In cutting the hole through the roof, be sure and get it exactly over the smoke hood of the boiler, so that the pipe will be perfectly vertical. Cut the hole round and of the same size as the double pipe, and cut it through the roofing and roof boards at the same time, if the roofing is on, and then place the plate so that all will be water-tight as above stated.

Install the pipe lines per the Drawings and the foregoing list, screwing the 3 in. vertical pipes into the top of the boiler first and then screw the balance of them and the fittings as per the list, being careful to get all pipes sloping slightly upwards on the flow pipes and downwards on the return pipes and get them all in their correct places. Before screwing the pipes together ream out the ends and remove all obstructions. Screw the pipes about ½ in. into the fittings and use red or white lead on all the joints, or use the cement or paste that is made especially for that purpose, so as to get an air-tight job, free from all leaks. If you find it necessary to bend some of the pipes slightly, do so with care so as not to buckle them.

The pipes running through the hovers are to come below the top of the cleats holding the frames and covers so they can lay level and true. Remove the cleats on the side of the floor hovers and then cut the notches the proper distance apart and the correct size so that the pipes 'n'-'m' will fit exactly into them. In the hover across the front, remove the pieces on top of the partitions and ends and notch the partitions for the pipes 'g' and then after the pipes are placed, fit the pieces on top, notching them properly. Do this all in a workmanlike manner, so all will fit nicely. If you wish, take some asbestos paper and cut into strips about 2 in. wide, and wrap the pipe where they come in contact with the wood. (See the Detail Sections of the Brooders and Hovers.)

The pipes 'n' and 'm' in the floor brooders are to be connected at the ends with a 6 in. piece of pipe with right and left threads so it can be screwed into both the ells, at the same time. The hole tapped for the air valve is to face up so the air valve will set vertical when screwed in. The connections between the pipe 'f' and 'h' on the east and west walls and the pipes passing through the front hovers 'g' are connected with 45 degree connections and pipes so that the wall pipes can set one above the other and the hover pipes can be on a level with each other.

The wall pipes 'j' and 'h' are to end in the vertical pipes 'i' that are capped with a cap that has an air valve screwed into it, this air valve setting vertical. This vertical pipe is shown on the Longitudinal Section.

The pipes on the wall are to be hung or secured by means of stirrups made of hoop iron or heavy tin cut into strips about 1 or 1½ in. wide, or if you prefer supply regulation pipe hangers, of which there are several styles on the market. The stirrups of hoop iron or tin strips are to be bent under the pipe and extend about 3 in. above the same and nailed at the upper end solidly. Thus hanging the pipe and giving ample room for shrinkage and expansion. One of these may be necessary on each stud for each pipe and don't forget in placing the pipe to let them slope slightly, so to quickly drain the water.

The pipes 'k' are to run under the floor until on the other side of 'l' where they start to slope up to the hover pipes 'm.' This will make them pass through the concrete walls of the pit so after you have the supply and return connections up so that you can locate the proper place, cut a hole in the wall for the pipes, using a cold chisel, chipping away the concrete until you have a hole about 2 in. larger than the pipe for each one. Dig the trench on the outside and make the connections. Before filling the earth back over the pipes paint them thoroughly and give enough time for drying. When filling in the earth, pack it around the pipes and tamp down solidly.

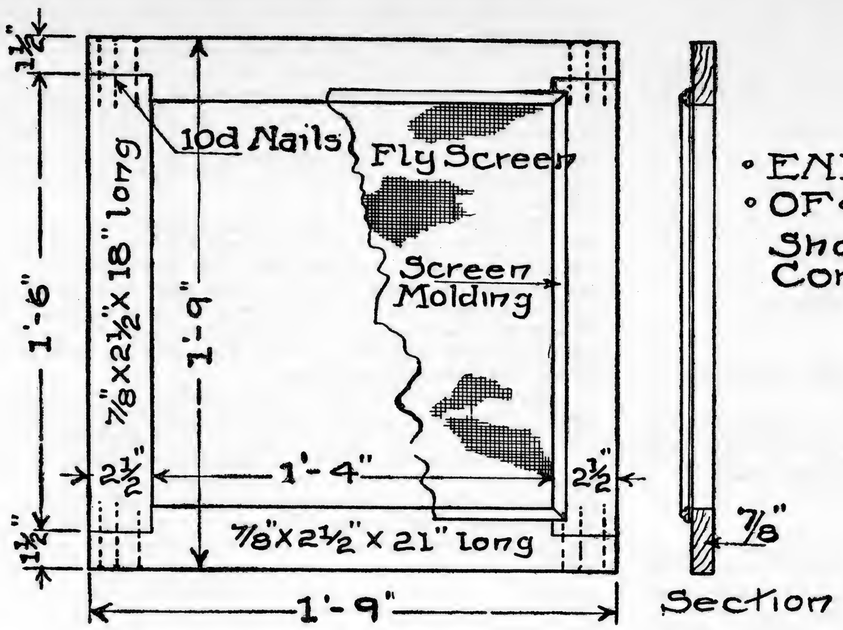
The radiator is connected by the pipes slanting up from the flow and return to the valves. The union on the valve is screwed into the bottom at each end of the radiator, indicated at 'p.' The connecting pipes are screwed into the reducing tee. The radiator is to set on the earth floor and it is a good idea to set the legs on bricks bedded into the earth, so as to get a good bearing. Screw the air valve into the ⅛ in. hole at the top of the radiator. The radiators generally come built up so you will not need to do that.

The expansion tank is to set above the Honeywell heat generator, per the list, and may be secured to the wall with a band of strap iron. Build a solid shelf or stand for the generator to set on at the proper height and so that it will set solidly and firm. If you wish you can set the tank on a couple brackets, although if it is well tied to the wall it will not need it.

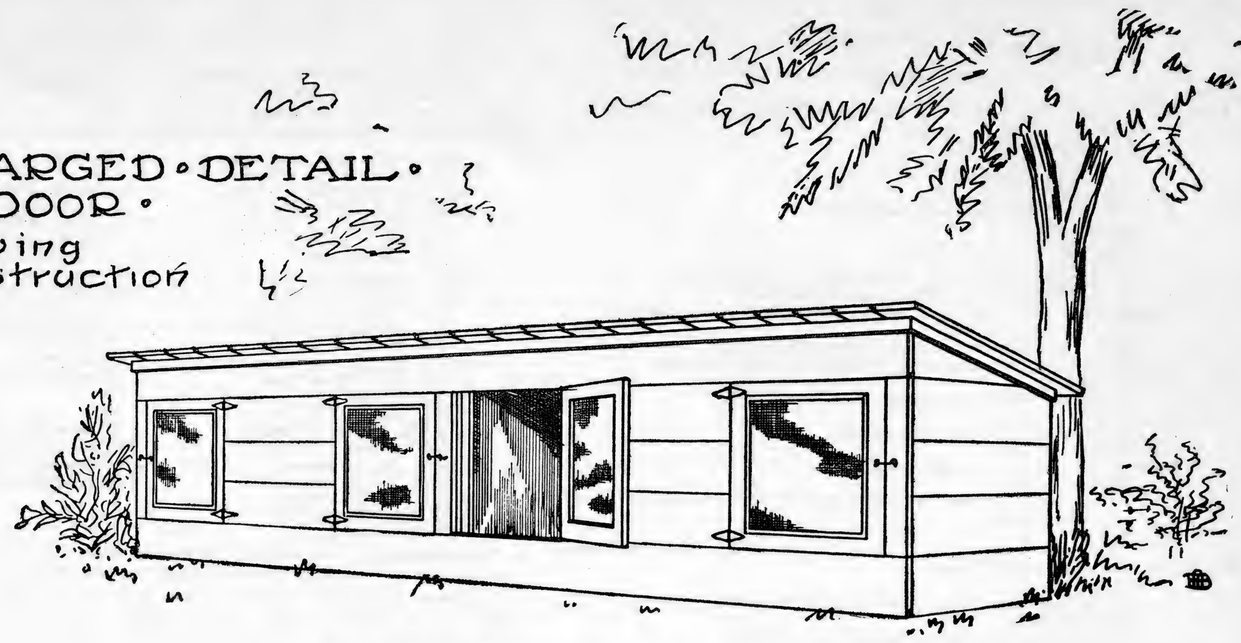
Screw the vents and overflow pipe into the top of the tank, passing the vent out through a hole in the wall to the outside air and running the overflow down into the pit toward the drain. Screw the short pieces of pipe with the hose connections on the end into the side of the tank, seeing that it faces so that it can be easily reached with a hose.

After the pipes are all connected and your job looks done, fill the whole system with water and go over all the joints, and if you find any leak, tighten them up so they will not leak any more. After this is done, paint all the piping, radiators, generator, etc., using graphite or other metal paint, or better still use the asphaltum or maroon japan that is especially prepared for this work.

When this painting is dried your heating system is ready for use. Fire and regulate the boiler as directed by the manufacturers of same, and keep three or four inches of water in the expansion tank at all times. When you close off the radiator, close off the valves tightly. To eliminate the air in the system, open up the air valves until water comes. The boiler may not do its best work at once, for the piping will have more or less oil in it, but after this is out it ought to give you entire satisfaction.



• ENLARGED • DETAIL •
• OF • DOOR •
Showing
Construction



• THUMB • SKETCH • of • COOP •
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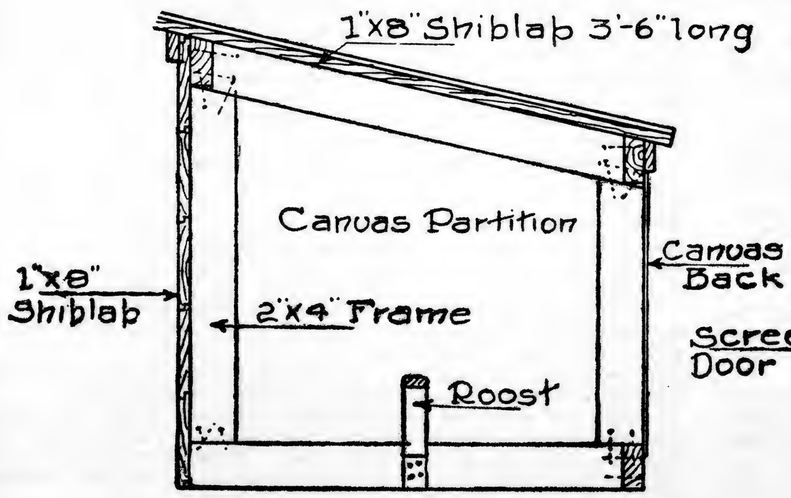
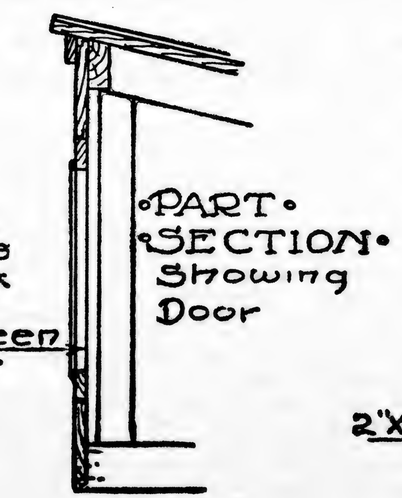
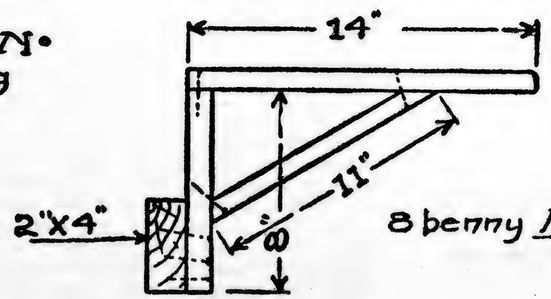
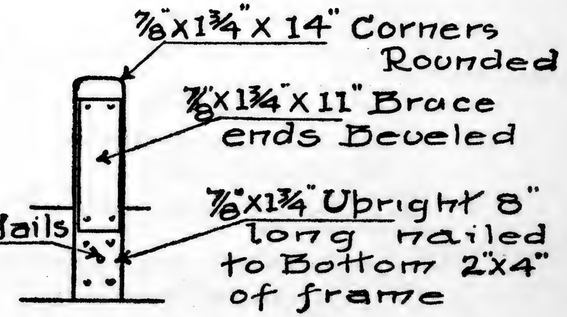




• PART •
• SECTION •
Showing
Door

• CROSS • SECTION •
Taken on Line A A on
ground plan; showing
frames assembled





• ENLARGED • DETAIL • of • ROOSTS •

KELLERSTRASS PLAN OF
FOUR COMPARTMENT
COCKEREL CONDITIONING COOP
AS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0 ft 1 ft 2 ft

PLATE • I •

FOUR COMPARTMENT COCKEREL CONDITIONING COOP

BILL OF MATERIALS.

5 pieces 2x4 Dimension stuff, 10 ft. long, 39 sq. ft. B. M.
3 pieces 2x4 Dimension stuff, 12 ft. long, 24 sq. ft. B. M.
6 pieces 1x8 Shiplap, 12 ft. long, 48 sq. ft. B. M.
5 pieces 1x8 Shiplap, 14 ft. long, 47 sq. ft. B. M.
3 pieces 1x6 Sheathing bds., 12 ft. long, 18 sq. ft. B. M.
24 Lin. Ft. Screen Molding.
20 or a 1-4 bunch of Lath.
1 yd. 36-in. wide Fly Screen.
3 yds. 30-in. wide Light Weight Canvas or Muslin.
4 yds. 24-in. wide Light Weight Canvas or Muslin.
8 6-in. Strap hinges with screws.
4 Wire hooks and eyes.
3 lbs. 8 penny (d.) nails.
1 lb. 10 penny nails.
½ lb. 20 penny nails.
¼ lb. 3 penny fine nails and some ½-in. brads.
1 Box broad headed tacks.
½ gal. White Paint—2 coats for roof and 1 for walls.
Some lime for Whitewash.
A little Creosote or Crude Carbolic Acid.

Instead of the lumber specified above, you can use lumber that you have around your place, cutting it to the best advantage, so as to make the pieces the same size as described in the following description of "How to Proceed with the Work."

HOW TO PROCEED WITH THE WORK.

This four-compartment cockerel coop is thoroughly detailed on the Drawings, Plate I, II and III, and ought not to require a very detailed description, but for your convenience a full description will be given.

First build the frames, which are of 2x4s, the length of which are shown on the Diagram on Plate III, and are shown assembled in the Cross Section on Plate I. There are five of these frames, so take the 10 ft. 2x4s and cut the five pieces necessary for each frame, viz.: one 2-ft. 10⅜-in piece, one 2 ft. 10 5-16-piece, one 2 ft. 4¾-in. piece, one 1 ft. 9 9-16-in. piece out of each 2x4, the latter three pieces are to be bevelled on their ends, as shown by the Diagram. Be sure and make all the cuts square and in a workmanlike manner.

Now take the three 12-ft. 2x4s and cut them down to 11 ft. 10 in. for the longitudinal pieces holding the frames apart; two of these are to be bevelled on the top, as shown on the Diagram.

After the frame pieces are all ready assemble them as shown on the Cross Section and indicated on the Diagram, and toe-nail fast and then put on the long pieces in their proper places, and nail fast the two end frames first, keeping their outer faces flush with the ends of the long 2x4s, then place the other frames between, spacing them as shown on the Ground Plan on Plate II, and after all are square and straight nail all solid, using the 10 and 20 d. nails.

When this frame is solid and rigid you are ready for the shiplap on the outside. First place a 12-ft. piece of shiplap across the bottom in front, letting it project evenly over both ends, per Front Elevation Plate I. Now nail the boards on the ends, per the End Elevation on Plate III, cutting the nine 3-ft. boards necessary out of three of the 12-ft. pieces, cutting four lengths off of two of them and one off of the third piece. Nail the four straight pieces on each end and then cut the remaining 3 ft. length on the diagonal, as shown on the Diagram for piece "A," and nail ½ on one end and the other half on the other end.

Take one of the 1x6 in. pieces of board and rip it into two strips, which plane or dress down to 2½ in. wide, and then cut three lengths 1 ft. 9⅜ in. out of one of them. Nail one of these pieces on the edge of each end frame and one on the center frame, as shown on the Front Elevation, cutting away the projecting lip of the rebate on the shiplap so that you can get a tight fit. Nail the end ones on with the outer edge flush with the face of the end shiplap and the center one in the center, as shown.

Now cut six 2 ft. 2 in. lengths out of the 9 ft. piece of shiplap left from cutting the extra end board and a 4 ft. 4 in. length off of another 12 ft. length. Nail these on the front as shown on the Elevation, placing them so that the distance from their end to the edge of the vertical strips will be equal on both sides, making all the openings the same size and nail solid, forcing them down tightly to each other.

When these are on, place the top 12 ft. length in place, and nail it and then saw the ends off flush with the face of the end shiplap, doing the same with the bottom 12 ft. piece. Nail all the shiplap on solidly, using 8 d. nails.

Take the 12 ft. 2½ in. strip and cut five lengths about 28 in. long and nail four of these along the ends of the 2 ft. 2 in. piece of shiplap, as indicated by the dotted line on the Front Elevation and shown on the Ground Plan. Set these so they project out beyond the ends of the shiplap to form a rebate for the doors. Take the extra piece and rip it in half, and nail it fast to the center frame, forming rebates there for the doors as shown on the Ground Plan.

For the roof, take the five 14 ft. pieces of shiplap, and cut twenty 3 ft. 6 in. pieces and take the remaining piece of shiplap and cut one or two more 3 ft. 6 in. pieces, as may be required. Lay these on the roof in such a way that the two outside pieces, which are to have the outside rebates planed off, will project the same over each end, and so that the projection over the front will be the same as that over the rear. Line all the pieces up so that they will present a straight edge both in front and back, and then nail solidly, using 8 d. nails.

The battens are now to be nailed on over the joints between the shiplap. For these, use the laths provided, placing the smooth side down and nailing fast with 3 d. fine nails. Cut them off flush with the edge of the roof.

Now take the remaining two pieces of 1x6 in. board and rip them into strips, planing or dressing the strips down to 2½ in. Take two of these and bevel the tops so that they will fit snugly under the roof boards, and after cutting them off so they will be the exact length of the coop, that the ends may be flush with the face of the end shiplap. Nail them fast, one in front and the other in back, fitting tightly under the eaves. Cut one more strip into two lengths about 3 ft. 4 in. and place under the eaves across the ends which slope up. Before nailing fast, cut the bevels on the ends so the ends will be flush with the outside face of the front and rear eave strips and then nail them in place.

The doors are detailed on Plate I. For these cut the remaining 12 ft. 2½ in. strips into eight pieces 18 in. long, and cut the other pieces left from the above cuttings into as many 21 in. pieces as you can get, which will be about six, and get two more 21x2½ in. pieces out of some other ⅞ in. board that you can most likely find around your place. Now notch the 21 in. pieces as shown on the Detail and then nail the pieces together, using 10 or 8 d. nails, whichever will work the best. When nailing these together be sure and keep them square and true.

Now stretch pieces of the screen over each door and secure with the screen molding and brads provided, stretching the wire taut. When this is done the doors are ready to be hung.

Fit the doors in place, first planing off as much of the projecting lip of the rebate on the shiplap as necessary, and if necessary plane some off of the doors until the doors will go into the openings properly. Then put on the hinges, driving all the screws well in; take care that each pair of hinges are exactly above each other so they will not bind, but swing true and easy. When these are on, put on the hooks and eyes and the front is ready to be painted.

Now tack the muslin or light weight canvas fast to the inside frames, forming the partitions. Use some of the 30 in. wide goods for this, driving the tacks about 3 in. apart. See that the canvas is stretched perfectly tight. Before placing the muslin or canvas on the back, put in the roosts.

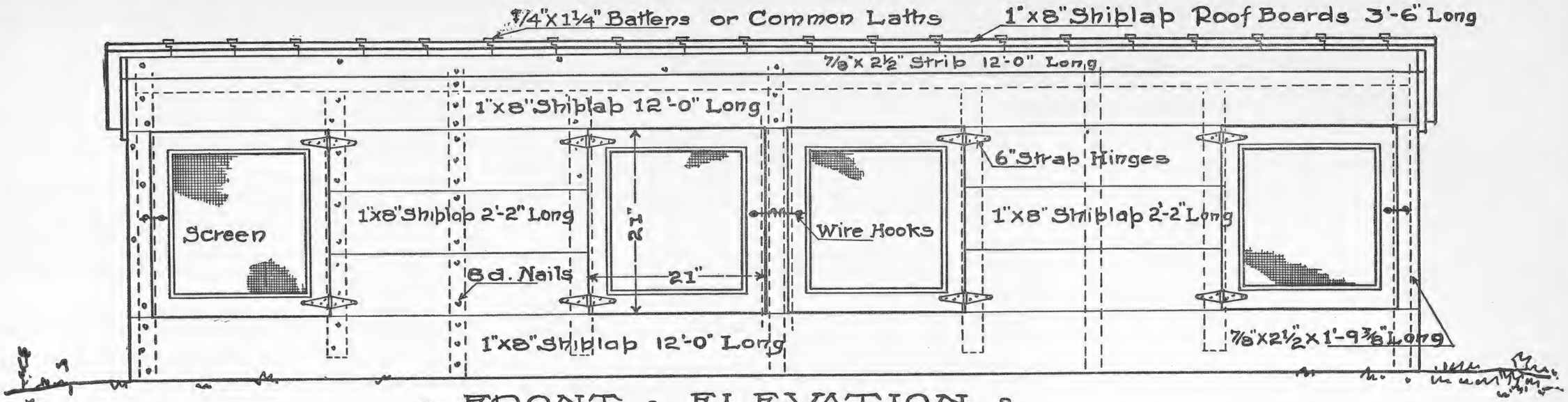
The roosts are to be made of ⅞x2 in. wide strips. It will take about 11 lin. ft. of this, and you can cut it out of waste pieces of lumber or other ⅞ in. lumber about the place. The roosts are completely detailed on Plate I, so make the lengths of the pieces, etc., as shown there and round the corners of the roosting piece. When these are nailed up solidly nail them fast to the 2x4 at the bottom of the partition frames, as shown on the Detail and as shown on the Ground Plan, Plate II.

After these are in place you can litt this series of boxes in place and toe-weight canvas on the back, stretching it perfectly taut and tacking fast with tacks 3 in. apart. For this use the 24 in. wide material. When tacking this fast it would be well to turn the edges under so as to make a neat appearance and also give the tacks a more solid hold of the goods.

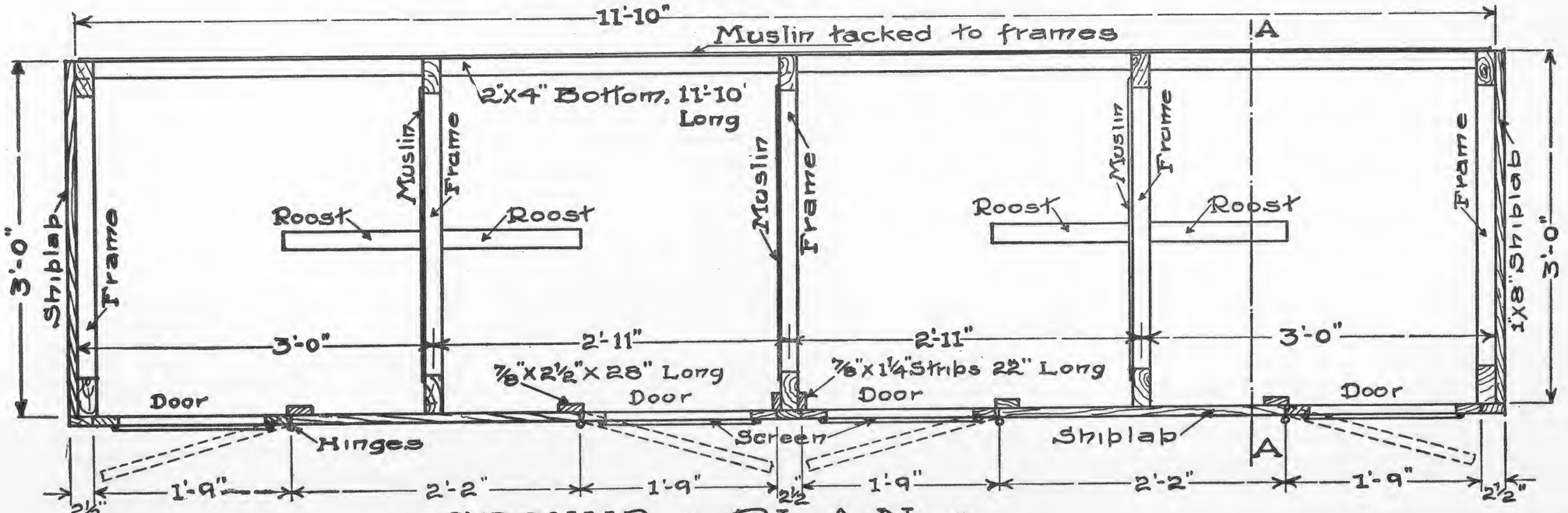
When all the above is done in a workmanlike manner, and all looks well, give the exterior and all parts exposed to the weather (roof, walls, eaves, doors, etc.) a coat of white paint, and when the first coat is dry, give it a second, if you wish. The roof, at least, should have a second coat.

When the paint is dry mix up some whitewash by slaking lime in water, adding enough water to make the whole about the consistency of thin cream and then whitewash the interior, all except the roosts, filling all cracks and crannies. Saturate the roosts with the creosote or crude carbolic acid you have provided. The interior can easily be reached by turning the coop on its side; this, of course, can only be done when the paint on the exterior is dry.

When this is all dry, place the coop on a grassy and comparatively level spot and it is ready for use.



• FRONT • ELEVATION •

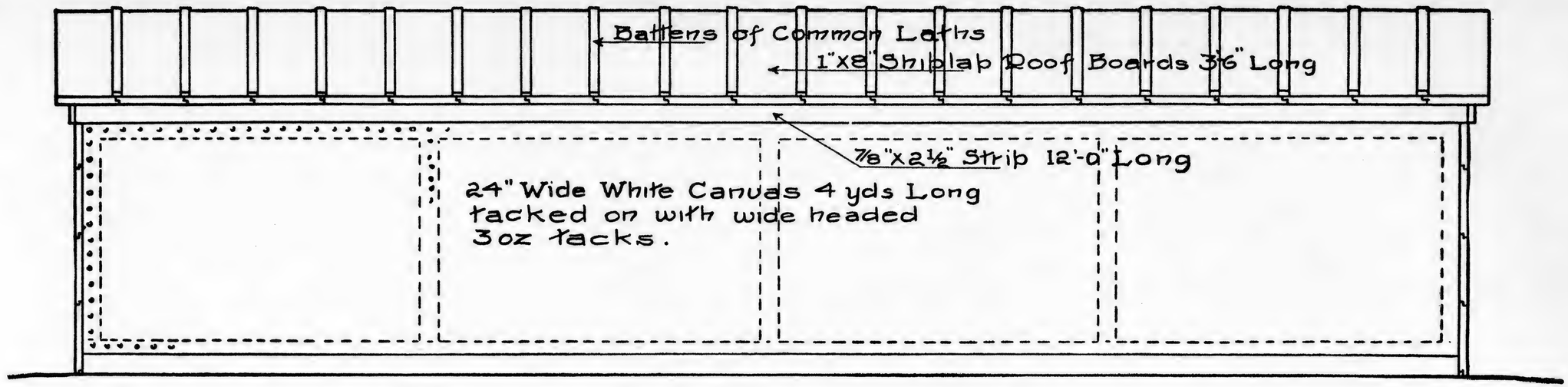


• GROUND • PLAN •

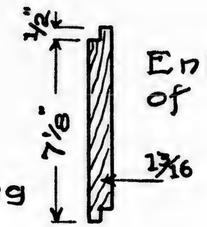
KELLERSTRASS PLAN OF

FOUR COMPARTMENT COCKEREL CONDITIONING COOP AS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

PLATE · II ·



• BACK • ELEVATION •



Enlarged Section of 1"x8" Shiplap.

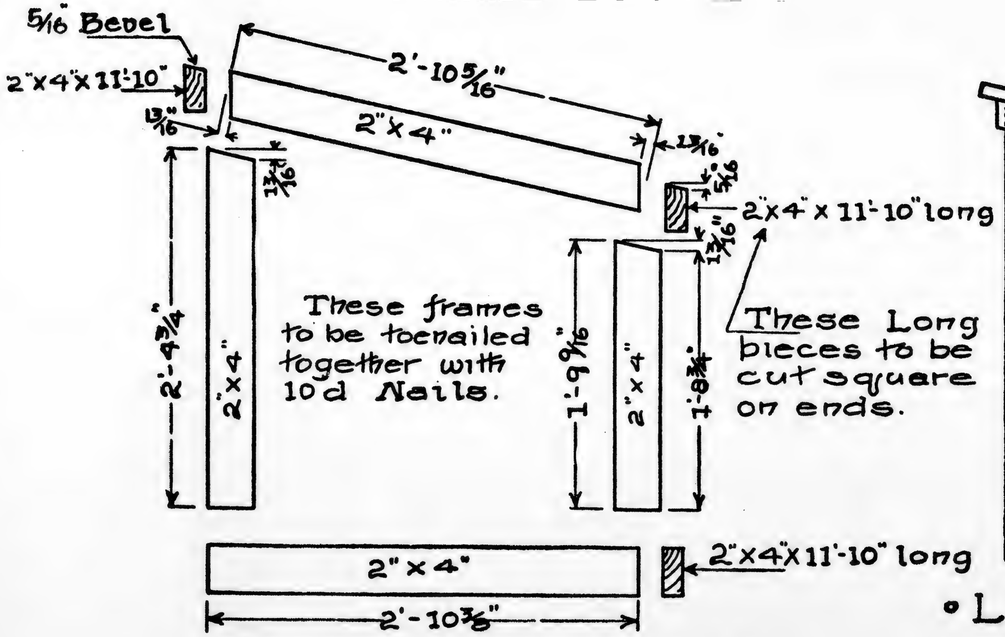
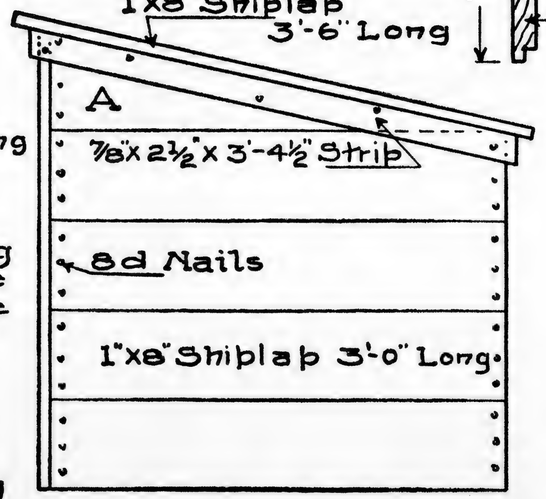


Diagram Showing pieces for Frames and how same are cut.



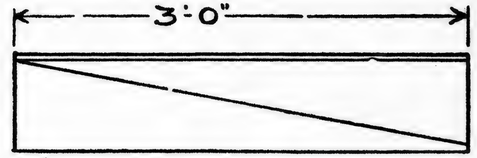


Diagram showing where to cut shiplap for triangular pieces A Lower half below diagonal to be used on left End and Ubber on Right End.

Right End Elevation will be same as Left except that it is reversed

• LEFT • END • ELEVATION •

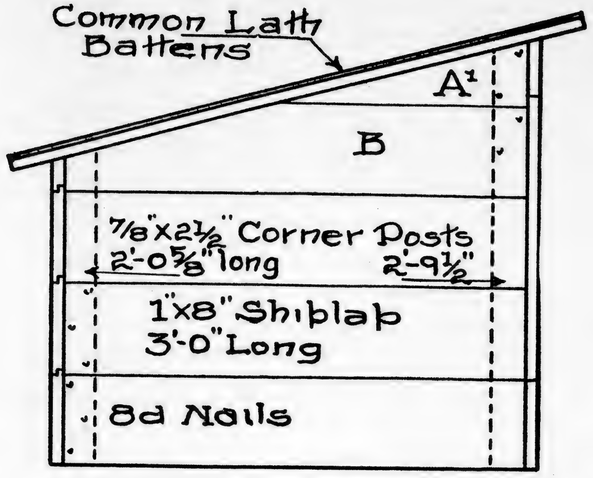
KELLERSTRASS PLAN OF FOUR COMPARTMENT

COCKEREL CONDITIONING COOP

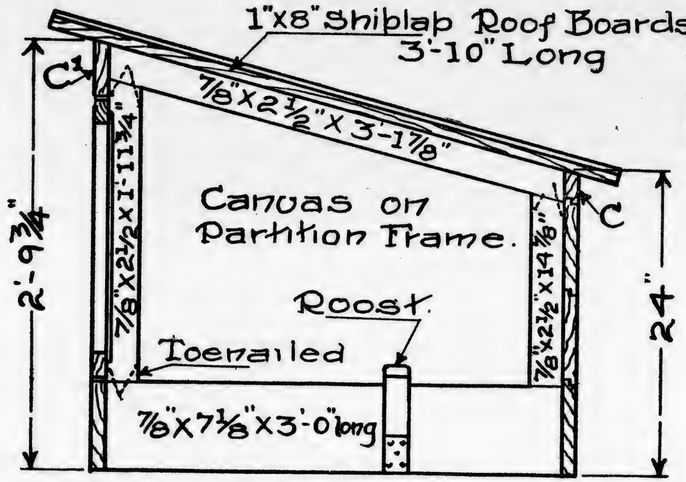
AS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0 ft 1 ft 2 ft

PLATE · III ·



• RIGHT • END • ELEVATION •



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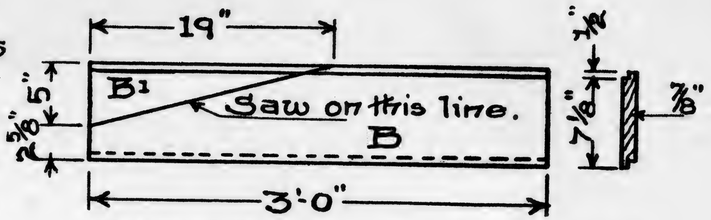
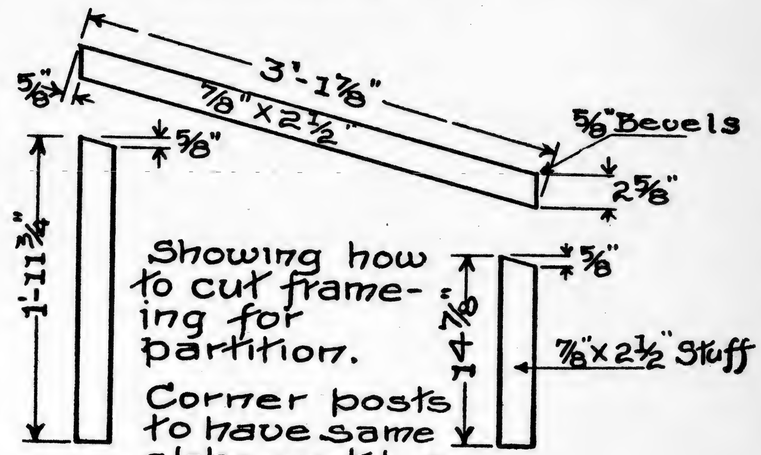
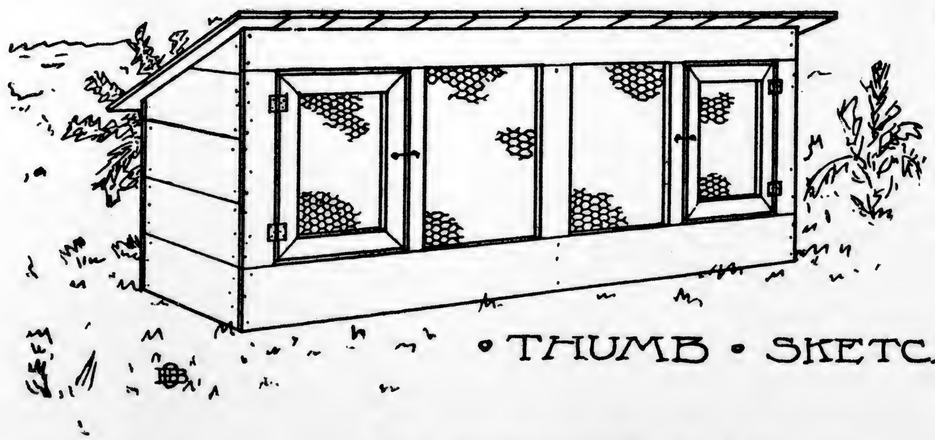


How to cut End Boards B & B1. AA¹ are cut same except that board is reversed.

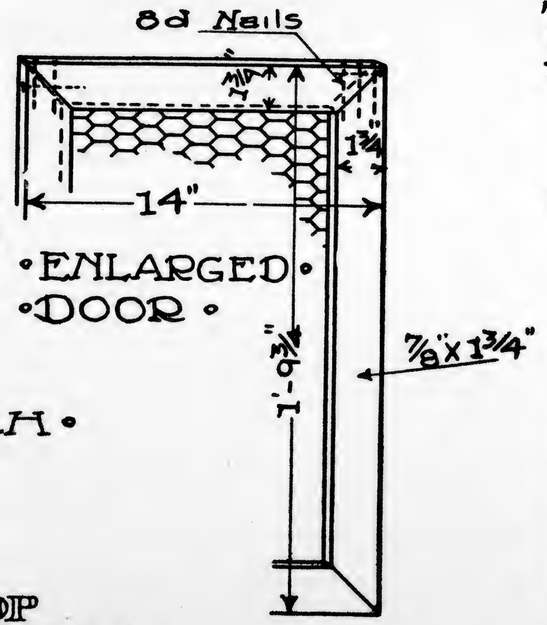


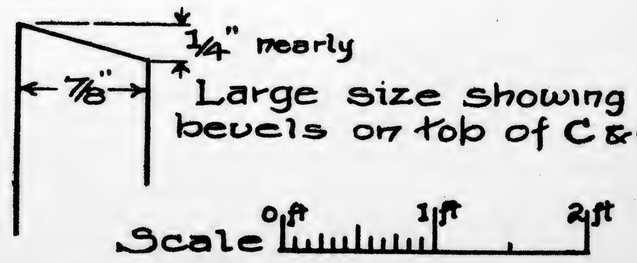
Showing how to cut framing for partition.

Corner posts to have same slope on top as these uprights.



• THUMB • SKETCH •





KELLERSTRASS PLAN OF TWO COMPARTMENT

COCKEREL CONDITIONING COOP

AS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO.

PLATE • I •

TWO COMPARTMENT COCKEREL CONDITIONING COOP

BILL OF MATERIALS.

8 pieces 1x8 in. shiplap, 12 ft. long, 64 sq. ft. B. M.
1 piece 1x8 in. sheathing bd., 6 ft. long, 4 sq.ft. B. M.
1 piece 1x10 in. sheathing bd., 12 ft. long, 10 sq. ft. B. M.
10 or a doz. laths.
5 lin. ft. 24 in. wide, 1-in. mesh Poultry wire.
1 yd. 24 in. wide light weight canvas or muslin.
4 2x2 in. hinges.
2 wire hooks and eyes.
2 lbs. 8 penny (d.) nails, common.
A few 10 penny finishing nails.
A few 3 penny fine nails.
1 box tacks, canvas.
75 small staples, poultry wire.
1 quart White Paint and a little Lime for whitewash.

If you wish, use pieces of lumber and boxes that you have around your place, or use such pieces of lumber you may have and then purchase the rest from the lumber yard. Thus the coop will not be very expensive.

HOW TO PROCEED WITH THE WORK.

This coop is thoroughly detailed on the two Plates, comprising the Drawings showing it.

Commence building this coop by nailing up the ends, for which cut eight 3 ft. lengths out of two 12 ft. pieces of shiplap. Take the 1x10 in. board and cut a strip that will dress down to 2½ in. without wasting any material, and then cut two pieces 2 ft. 9½ in. long and two pieces 2 ft. ⅝ in. long for the corner posts. These are to be bevelled on top about ⅝ in. as indicated on the Detail or Diagram on Plate I.

Now take two of the 3 ft. pieces of shiplap and mark a diagonal across one corner as shown on the Detail of pieces "A" and "B" on Plate I. And saw off on the line so that when the triangular piece "A'" is placed over "B" and the piece "B'" is placed over "A," the two combined pieces will be exactly alike, except that the rebates on one turn in, and on the other turn out, so that they can be placed on opposite ends. So be careful when marking the diagonal so that the boards are not the same, but reversed, so as to work properly.

Now lay one set of these pieces of shiplap (comprising three 3 ft. pieces and pieces "A" and "B'" or pieces "B" and "A'" depending upon which end you take) and nail the cleats or corner posts on. The bevels on them sloping with the slope of the pieces "A" and "B" and place them so that the edge of the corner posts will be flush with the ends of the shiplap, and then nail solid. Nail both ends up in this way and after they are solid, plane the slant down so that it will be perfectly straight and true and exactly the same on both ends.

The frame for the canvas partition is to be built next. Take one of the pieces of shiplap and cut a 3 ft. length off of it and plane the rebates off so it will be 7⅛ in. wide. Take the 2 ft. 3 in. piece of 2½ in. strip left from above, and cut it down to 1 ft. 11¾ in. and bevel the top per the Diagram on Plate I, showing how to cut the pieces for the frame. Take the 7 in. piece left from cutting the 1x10 in. board and rip a 2½ in. strip 4 ft. 5 in. long. Do not rip any further than just enough to get the desired length, making a notch of that size in the 7 in. board. Cut this 4 ft. 5 in. piece into a 3 ft. 1⅛ in. length, and a 14⅞ in. length, the former to be bevelled at both ends and the latter at the top, as shown on the Diagram.

Place these pieces together and toe-nail securely, making all joints in a workmanlike manner, and keep the bottom ones square as shown on the Sections. This frame, when nailed up, should be exactly the same shape and size as the end. If it is not, plane it off or remodel it, so that all three pieces, frame and ends, will be exactly the same shape. Before planing anything like this off, be sure that the nails are well countersunk into the wood so you will not strike them with the blade of the plane.

Take the 6 ft. 1x8 in. board and plane it down to 7⅛ inches wide for the front. Take two pieces of the shiplap and cut it into four 6 ft. lengths. Take one of these and rip a 2⅝ in. strip off of it, making the piece marked "C" on the Rear Elevation on Plate II. This strip and the three 6 ft. pieces are for the rear and the wide strip off of "C" viz: "C'" is for the front. Take the pieces "C" and "C'" and bevel the tops per the Detail on Plate I, being careful to get them bevelled in the right direction and on the right side. The bevel on "C" sloping toward the lip side of the piece of shiplap and the bevel on "C'" to be cut on the lip edge of the piece, planing off part of the rebate, thus not making the piece too narrow by having to bevel the square edge and plane the lip of the rebate entirely off both. All to be as indicated by the Section on Plate I.

Set one of the ends up and nail the bottom piece of shiplap on the back and the 7⅛ in. board across the front, as indicated on the Elevations, being careful to keep the ends of the boards flush with the outside face of the shiplap end. The cleats or corner posts coming on the inside, and see that all is perfectly square before nailing solid. Set the opposite end up and nail it fast and then set the partition frame in place and secure it. Now put the rear boards in place, topping them off with the piece "C" and nail all solid. The bevel on piece "C" should come flush with the slope of the ends and frame, but if it does not, make it so by planing or raising it up a trifle so all will be flush on top. Place the piece "C'" in position across the front, making the bevel on it flush with the slope on the ends and partition and nail it fast, Use 8 d. nails for this work and before nailing solid be sure that everything is square and true and that the partition frame is set exactly in the center between the ends.

Place the vertical pieces on the front in position next; for these rip a 5 ft. 8 in. long piece 3½ in. wide off of the remaining 7 in. piece of the 1x10, ripping it off of the same side as the last piece was, and in the same manner, and then cut three pieces out of the 5 ft. 8 in. piece that are a little over 1 ft. 10 in. long, so they will have to be fitted in place. Out of what is left of the 1x10 cut two more strips 1¾ in. wide and a little over 1 ft. 10 in. long and dress these down to width.

Now fit the 3½ in. wide pieces one in the center and one at each end, as shown on the Front Elevation and nail them fast. The edge of the outside ones coming flush with the outside of the end and the center piece being set exactly in the center, as shown. Fit these so you will have neat joints at the top and bottom, and if you wish toe-nail them fast to the top and bottom pieces of the front. Now fit the 1¾ in. pieces in their proper places as shown on the Front Elevation, setting them about 14⅛ or ¼ in. away from the edge of the 3½ in. pieces as shown on the Elevation and marked on the Ground Plan. Toe-nail these solidly in place, being careful to keep them perfectly vertical.

You are now ready for the roof, so take the remaining pieces of shiplap and cut into eleven pieces 3 ft. 10 in. long, lay these on the roof, placing them so that the projection on the ends are the same on both sides, and the projection in the front and back are equal. The two outside boards are to have the projecting lips of the rebates planed or ripped off, so as to make a square outside edge. When they are all laid properly and are tight together, nail them in place solidly, using 8 d. nails, nailing into the edges of the front, backs and ends, making all secure. See that these fit tightly down on top of the edges so as to leave no open cracks or spaces there.

For the battens over the joints or cracks between the pieces of shiplap on the roof use the laths provided, placing them down, with the smoothest side coming in contact with the roof boards. Nail these fast with 3 d. nails and see that they are spaced evenly and thoroughly cover the joints, making a neat and tight job.

For the doors, rip the remainder of the 1x10 in. piece of board into 1¾ in. strips, which cut into the following lengths: four pieces 1 ft. 9¾ in. and four pieces 1 ft. 2 in. Make these strips a trifle wider than 1¾ in. so they will have to be planed or dressed down to that size, so there will be no rough edges. Cut the ends of these pieces off on 45 degrees, so they will mitre as shown on the Front Elevation, and the Detail of the door on Plate I. Place these mitred pieces together as shown on the Detail and nail solidly, keeping all the corners square and be careful that they do not slip while nailing, making sharp, projecting edges on the corners, which make decidedly the reverse from a neat looking job.

When the door frames are nailed up satisfactorily, cut some pieces of the 1 in. mesh poulry wire and secure on the inner sides of the door with small staples, and then place the 2x2 in. hinges in place, two on each door, and hang the doors, placing them so that they will be exactly in the center of the openings. They can be held in that position while fastening the hinges by driving wedges in around the opening, holding them secure.

In placing the hinges be careful to get them on square and true so the doors will swing all right. Now nail a couple of nails into the inside corner of the 1¾ in. piece forming the jamb of the door, as shown on the Detail on Plate II to form stops for the door. Drive these in and bend them so they come in contact with the door just when the outside face of the door is flush with the outside face of the front. After this is done, screw fast the hooks and eyes in their proper places and the doors are done.

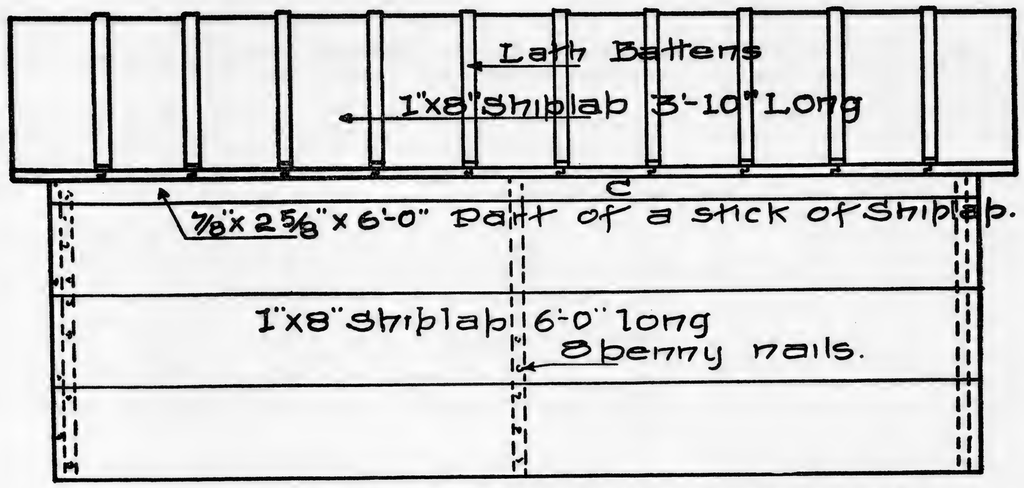
Now turn the coop over on the roof and stretch the poultry wire over the front on the inside, securing it with the small staples driven about 4 in. apart. Stretch the muslin or canvas over the partition frame, tacking it fast with tacks about 3 in. apart.

Build the roosts out of ⅞x1¾ or 2 in. strips, as shown by the Detail, which gives the length, etc., of each piece. Round the top of the roosting piece off, as shown. There will be two roosts and it will take about 5½ ft. of strips for them. After these are nailed up solidly nail them fast on the bottom boards of the partition, as shown on the Plans and Section and the woodwork is done.

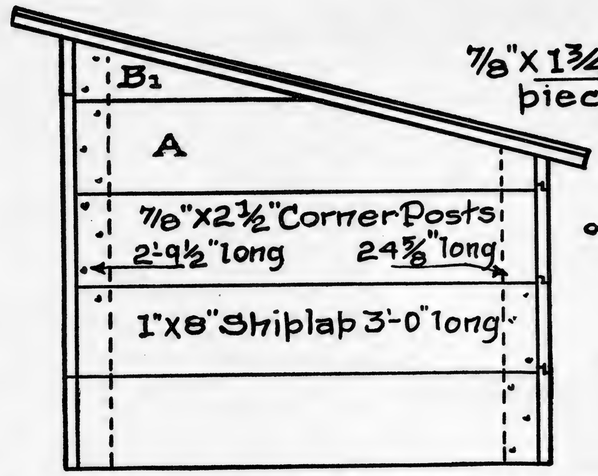
While the coop is still lying on its back, mix up some whitewash of lime and water and coat the interior thoroughly, all except the roosts, filling all the cracks well. Coat the roosts with some creosote or crude carbolic acid or some other such wood preservative.

When the whitewash is dry, turn the coop back to its correct position and paint the exterior with the oil paint you have provided, giving the roof two coats of paint, leaving about a week between each coat.

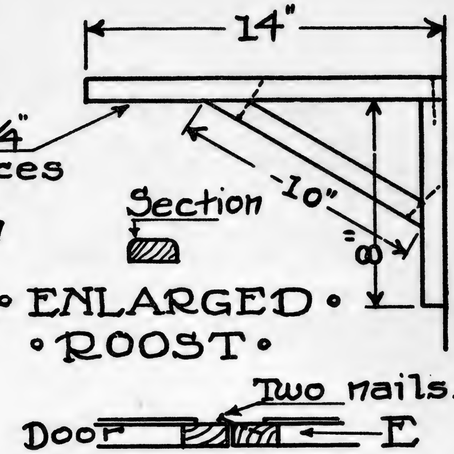
When the paint is thoroughly dry the Conditioning Coop is ready for use, so set it out on a grassy plot and place your cockerels in it, and move it a little every day so that your birds will always have fresh earth in which to work.



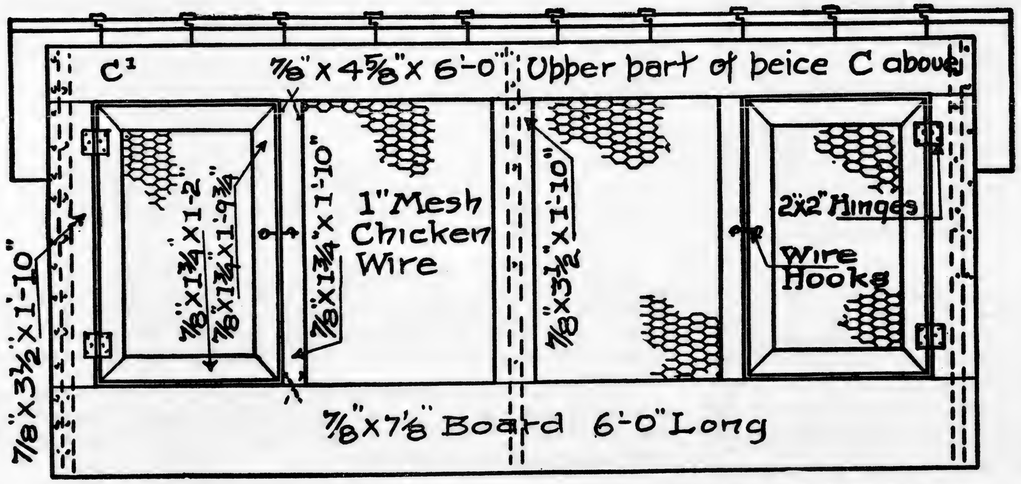
• REAR • ELEVATION •



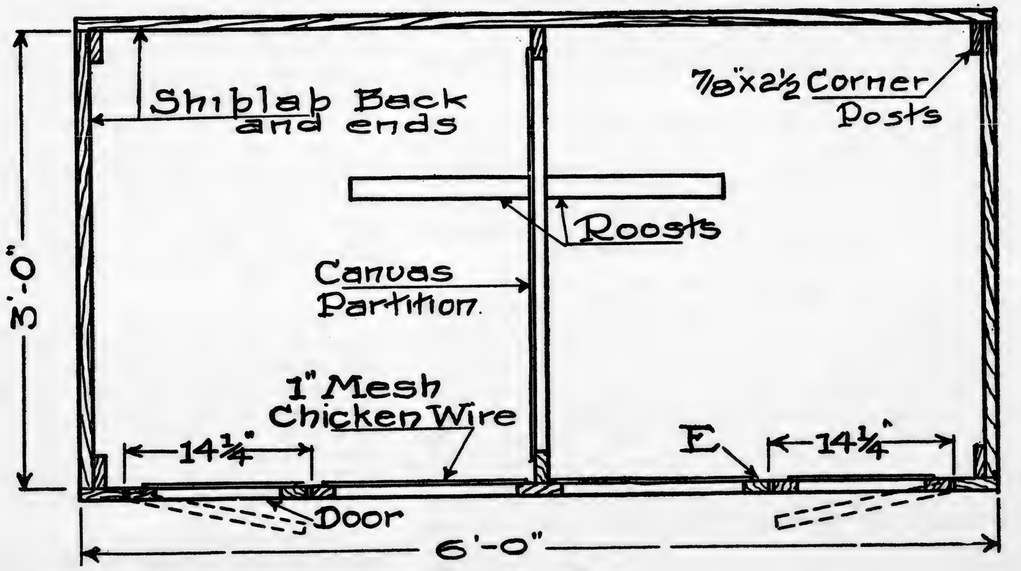
• LEFT • END • ELEV. •



Enlarged Detail to Show how nails are driven to form stops for Doors.



• FRONT • ELEVATION •

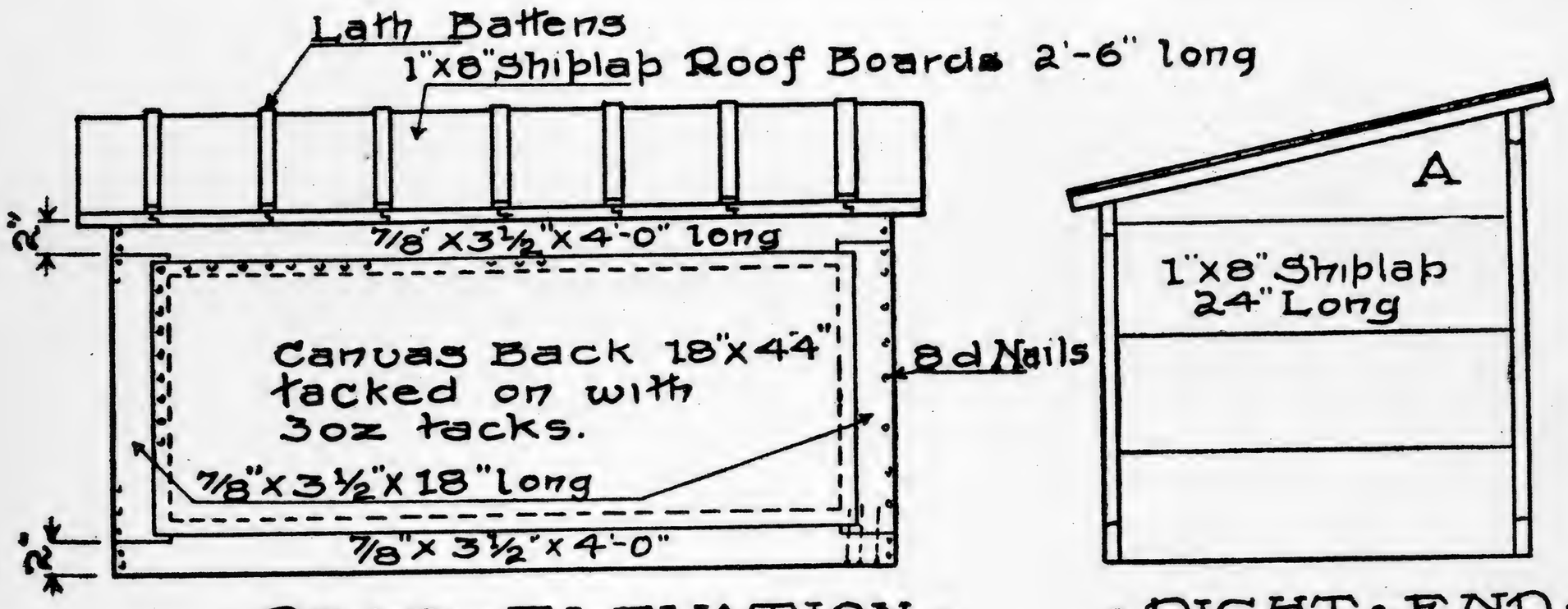


• GROUND • PLAN •

Scale 0ft 1ft 2ft

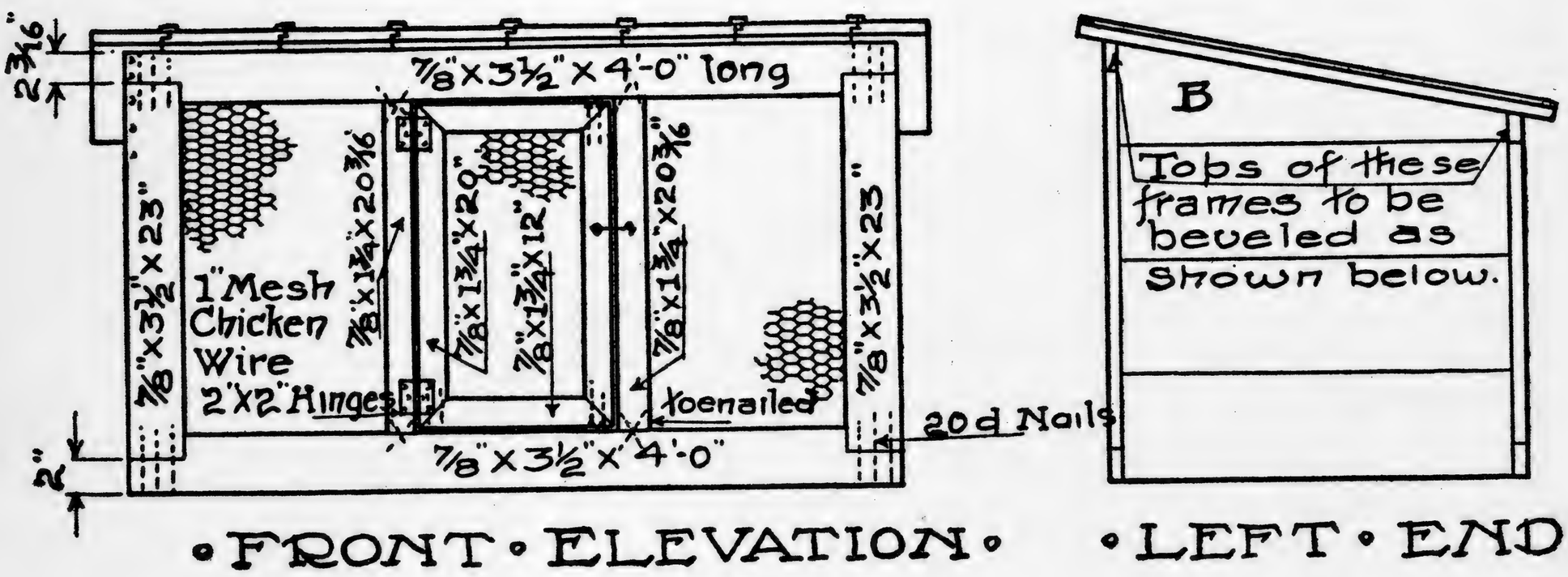
KELLERSTRASS PLAN OF
TWO COMPARTMENT
COCKEREL CONDITIONING COOP
AS BUILT ON THE KELLERSTRASS FARM, KANSAS CITY, MO

PLATE • II •



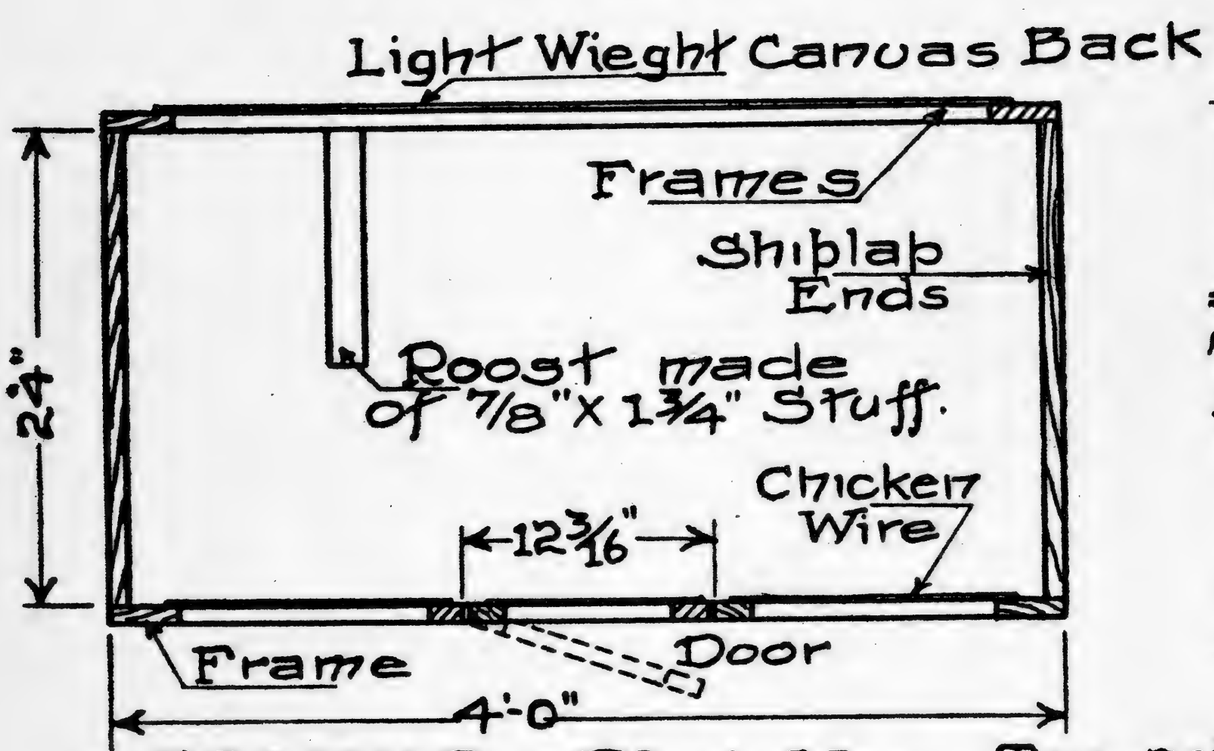
• REAR • ELEVATION •

• RIGHT • END •

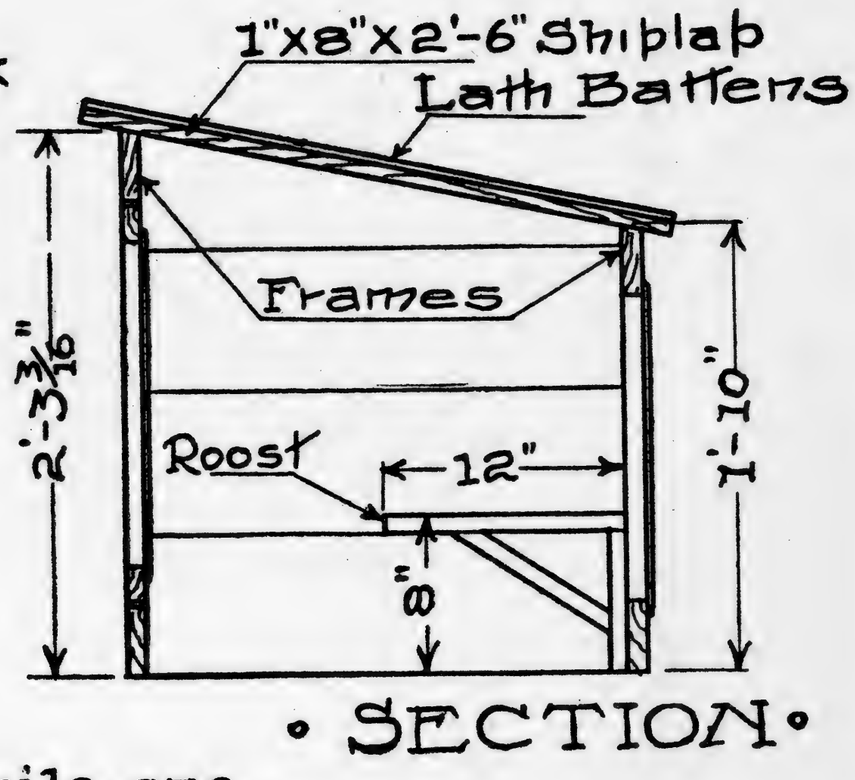


• FRONT • ELEVATION •

• LEFT • END •



• GROUND • PLAN •



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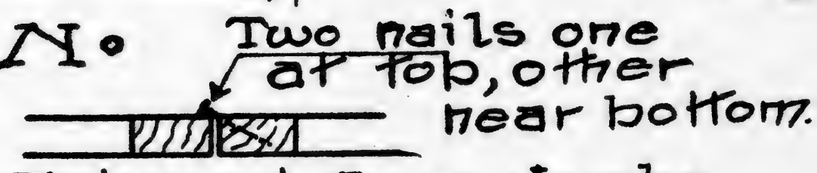
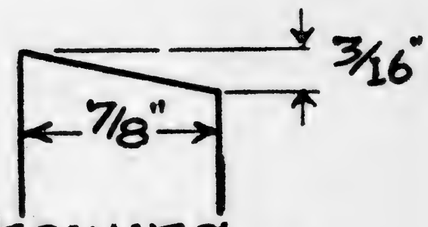
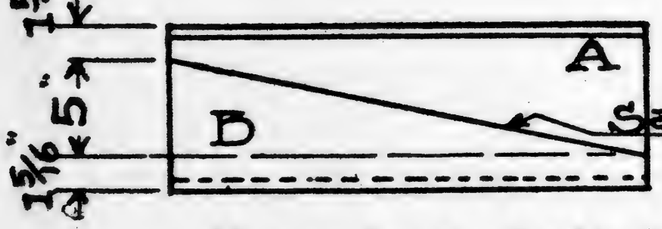


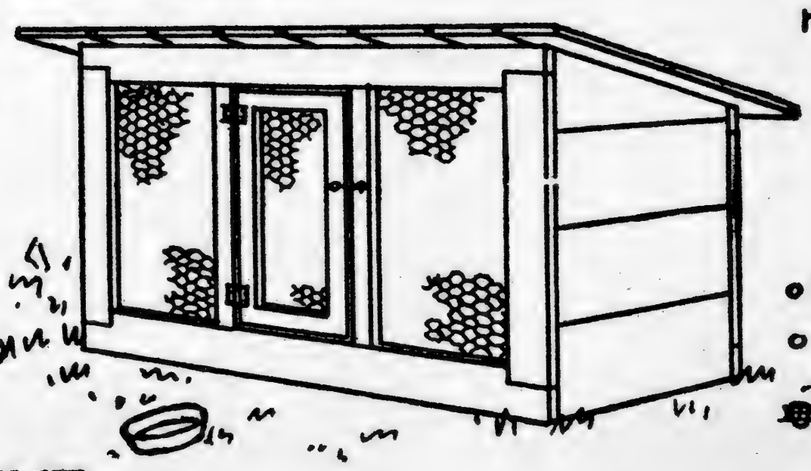
Enlarged Door Jambs showing Nails forming stops.



Showing bevel on top members of frames.



How to Cut Shiplab to get A & B



• THUMB • SKETCH •

KELLERSTRASS PLAN OF

BROOD COOP

OR

SINGLE COMPARTMENT

COCKEREL CONDITIONING COOP

AS BUILT ON

THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 0 ft 1 ft 2 ft

PLATE • I •

BROOD COOP OR SINGLE COMPARTMENT COCKEREL CONDITIONING COOP

BILL OF MATERIALS.

1 piece 1x8 shiplap 14 ft. long, 9 ft. 4 in. B. M.
2 pieces 1x8 shiplap 10 ft. long, 13 ft. 4 in. B. M.
1 piece 1x8 sheathing bd. 14 ft. long, 9 ft. 4 in. B. M.
4 ft. of 18 in. wide muslin or light weight canvas.
3½ ft. of 24-inch wide poultry wire, 1 in. mesh.
2-2x2 in. hinges with screws.
1 wire hook and eyes.
¾ lb. 8 penny (d.) nails.
½ lb. 20 penny finishing nails.
Some 3 penny fine nails.
1 box tacks.
50 staples.
1 pint of White Paint.
Some lime for whitewash.

(You can use material you have around your place, out of which to build this, using box lumber and other pieces, and buy only such pieces as you may not have. In that way the coop will not cost you very much.)

HOW TO PROCEED WITH THE WORK.

Commence to build this coop by building the frames for the front and rear first. Take the 1x8 in. board and rip two pieces 8 ft. long by 3½ in. wide off of it. Do not rip the entire 14 ft. length but just far enough to get the desired 8 ft. length. It would be well to rip these strips so they can be planed down to 3½ in., just making them a trifle over that measure so as not to waste material. In the same manner cut a 3½ in. piece 3 ft. 10 in. long, and a 3½ in. piece 3 ft. long, the remaining parts to be ripped to 1¾ in. strips for the doors, etc., as described later.

For the front frame, take one of the 8 ft. 3½ in. strips and cut it up into two 4 ft. lengths, which notch, notching as shown on the Front Elevation, Plate I. and then take the 3 ft. 10 in. 3½ in. strip and cut into two lengths 23 in. long, taking care to make all cuts square. Nail these members together, as indicated on the Elevation, using 20 d. finishing nails, and keep all corners square and true. Bevel the top edge of the frame, as shown on the Detail, doing all the work in a workmanlike manner.

For the back or rear frame, take the other 8 ft. piece, and saw it in two 4 ft. lengths and take the 3 ft. 3½ in. strip and saw into two 18 in. lengths, notch the 4 ft. pieces as shown on the Rear Elevation, and nail the frames up in the same manner as described for the front frames, bevelling the top properly, per the Detail. The frames are now ready to be connected by the end pieces of shiplap.

The ends are built of shiplap, so take the 14 ft. piece of shiplap and cut seven 2 ft. lengths off of it. Take one of these pieces and mark off a diagonal on it, as shown on the Detail, showing how to cut the shiplap to get the pieces "A" and "B." Be careful in doing this to get both sides exactly alike and then make a straight saw-cut on the line, separating the pieces "A" and "B" for the sloping pieces on the Right and Left Ends.

Set the rear frame up vertical and nail through it near the edge into the end of one of the 2-ft. pieces of shiplap, viz.: the bottom piece. Put up the bottom piece at the opposite end and then set up the front frame and nail it fast. Then nail in the other four pieces of straight shiplap, two to each end, and then put in the sloping pieces, nailing all solid, using 8 d. nails. In placing the shiplap, be sure and get the rebates on the top side, facing out so that the lip at the bottom will turn the water and keep the face of the shiplap flush with the edge of the frame, so it will be a workmanlike job. Now plane off the slope of the boards, so that they will be perfectly flush with the top of the frames and all straight, so the roof boards can get a good and tight bearing.

Take the two pieces of 10-ft. shiplap and cut into eight 2 ft. 6 in. lengths which place on the roof. After planing or ripping off the extending lip of the outside boards move the whole until the projection over the ends is the same at both ends and so the projection over the front will be the same as at the rear. When the boards are so set, with their ends all straight and even and set tightly together, nail all solid, nailing into the top edge of the frames, using 8 d. nails.

Place the battens of common lath in place over the joints between the shiplap, and nail on solidly and cut off flush with the edge, of the roof boards. Space these evenly so as to make a neat appearance. Nail on with 3 d. nails.

Now out of the piece of the 1x8 that is left, rip some 1¾ in. strips, which are to be cut into the following lengths: two pieces 20 3-16 in. long, two pieces 20 in. long, two pieces 12 in. long, which can easily be done. Rip these strips a trifle wide so they can be dressed down to 1¾ in. so they will not have rough edges and sides.

The two 20 3-16 in. pieces are to be fitted in the front frame to form jambs for the door, as shown on the Front Elevation. Fit these tightly and place them the correct distance apart and exactly in the center, as shown, and toe-nail fast.

The 12 in. and 20 in. pieces are to be cut off at a 45 degree angle on the ends so as to mitre for the door, as shown on the Elevation. Cut these mitres and then nail the door frame together, taking care to keep the corners perfectly square and true so that one part will not project over the other, making a poor looking job. Stretch a piece of the 1-in. mesh poultry wire across the inner side of the door frame and then hang the door with the 2 in. x 2 in. hinges, placing the door so it will be exactly in the center of the opening, and after this is hinged correctly, put on the wire hook and eyes, and the door is secure. Drive a couple nails in the striking jamb of the door, as shown on the Detail, to form stops for the door. These can be driven in the corner of the jamb and then bent so as to catch and hold the door in the right place.

For the roosts, cut out of any piece of ⅞ in. lumber a 2 in. wide strip about 30 in. long, and cut a 12 in., a 7¼ in. and about a 9½ in. length out of it. The 12 in. piece to be rounded on the top for the horizontal part, and the 9½ in. piece to be beveled to serve as a brace, the 7¼ in. piece being the upright, all as shown on the Cross Section. Nail this up solidly and then turn the coop over on its roof and nail fast, as shown on the Section and on the Plan. This completes the woodwork.

While the coop is lying on its back, or if you wish, turn it on its face, placing blocks under it, so the projecting roof boards do not strike, and stretch the poultry wire in place over each side of the front frame. Secure it with small staples driven about four inches apart.

After this is on, mix up some whitewash and cover the entire inside thoroughly, and if you have some creosote or other similar material, give the roosts a good coat of it.

Now right the coop and while the whitewash on the inside is drying, stretch the piece of canvas or muslin over the back, tacking it fast with tacks spaced at most 3 inches apart, turning the edges under so as to present a neat appearance. Be sure and stretch this taut.

When the whitewash is dry, paint the outside with oil paint, giving it a good sound coat or two, or if you prefer, whitewash the exterior as well as the interior, although the paint is very much superior. When the paint is dry, the coop is done.

Set it out on a grassy plot, hang a semi-circular drinking cup near the door, so it can be easily reached, and the coop is ready for use as a Conditioning Coop. When used as a Brood Coop, raise it up off the ground by means of bricks or blocks, set under the corners, raising it sufficiently to allow the little chicks free passage to and fro. And when the day is done, and the chicks are all inside, remove the blocks and let the coop down, thus keeping out vermin, etc.

Holes for hanging wires to pass thru.

4'-0" Common laths 1¼" apart.

⅞"x1¾"x18" Corner Posts

⅞"x1¾"x2'-8½"

Showing corner of Roof

Feed Trough Boards 2'-7⅝" long.

3 ft Common Laths

Ends ⅞"x3"x6" piece of Cieling nailed to Corner Posts

Laths on Bottom to be 4 ft long 1¼" apart.

3'-0"

4'-0"

∘ PLAN ∘

∘ with ∘ laths ∘ on ∘ bottom ∘ ∘ not ∘ shown ∘

½"x4" Cieling 19½" long

Same

Tin Ridge bent over joint.

½"x4" Ceiling 19½" long. Roof boards.

⅞"x1¾" Cut to fit between Gable Boards

⅞"x1¾"x18"

1¾"x⅞"x2'-8½"

∘ CROSS ∘ SECTION ∘

½"x2½"x2'-7⅝"

½"x3"x2'-7⅝"

∘ LONG'T'D'L ∘ SECTION ∘

Gable boards of ½"x4" Ceiling 3'-0" long with about 2" slope from center to ends.

Coupled Laths to Slide open forming sliding door.

Feed Trough

18" lath nailed on to form slots for slideing Laths.

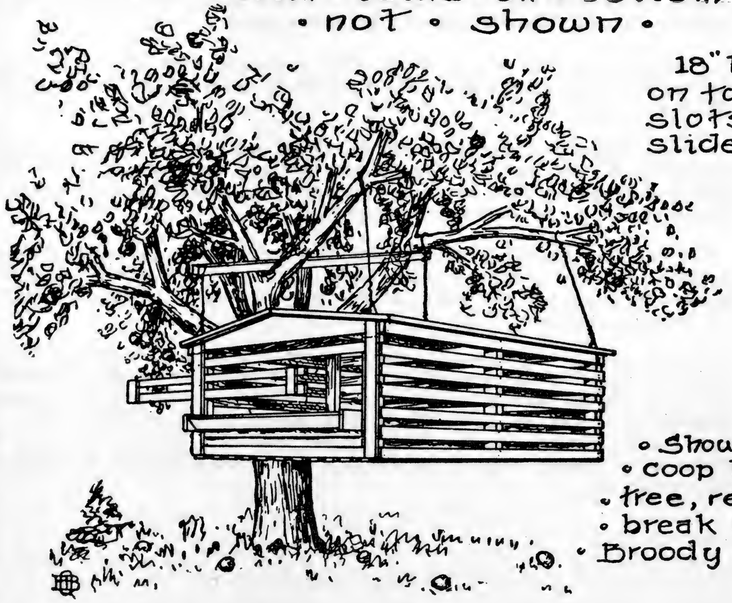
∘ END ∘ ELEVATION ∘

Wires, to hang coop on tree branch with.

⅞"x1¾"x4'-0" Common Laths 4'-0" long about 1¼" apart.

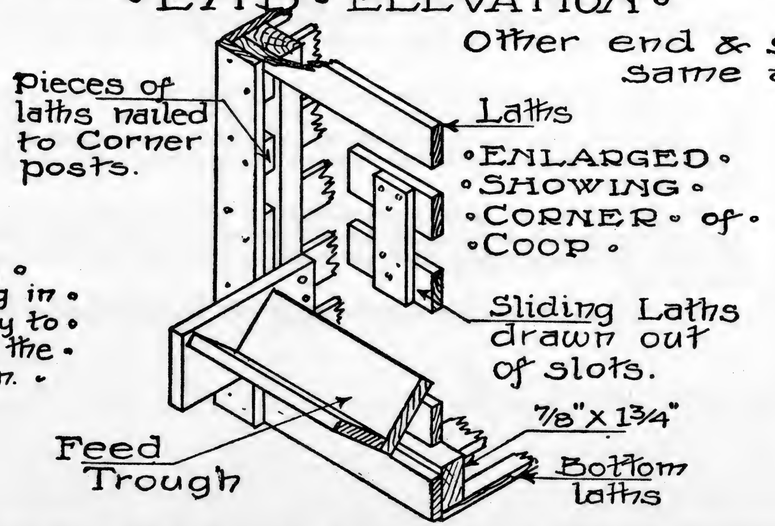
∘ SIDE ∘ ELEVATION ∘

Other end & side elevations are the same as these.



∘ Showing ∘ coop hung in ∘ tree, ready to ∘ break up the ∘ Broody Hen. ∘

∘ THUMB ∘ SKETCH ∘



KELLERSTRASS PLAN OF

BROODY HEN COOP

AS BUILT ON THE KELLERSTRASS FARM KANSAS CITY, MO.

Scale 12 in. 0 1 ft

PLATE ∘I∘

BROODY HEN COOP

IN GENERAL.

The Drawings show this coop completely. Instead of building it as shown on the Drawings and hereinafter described, you can get a common market coop or any other square coop and remodel it so that the roof will drain water and so the bottom will be slats, so the hens will have no floor or level place on which to set. After you have your common coop remodeled hang it in a tree in the same manner as shown in the Drawings and it will perform the same service as the coop herein detailed and described.

For building this Brood Coop according to the Drawings you will need the material in the following list, or its equivalent, which means that any other materials that will do the same work will do. Common box lumber and other pieces of boards and strips will be as good as the material mentioned, if it will cut up properly and work as above stated. By using such lumber and material that you may have around the place and purchasing only such as you may not have this coop will not cost very much.

LIST OF MATERIALS.

5 pieces ½x4 in. Beaded ceiling, 10 ft. length.
1 piece ½x4 in. board, 12 ft. long.
1 piece ½x4 in. board, 10 ft. long.
1 piece 1x6 in. board, 10 ft. long.
50 or a half bunch of Laths.
1 lb. 3 d. lath nails.
¼ lb. 4 d. common nails.
¼ lb. 10 d. finishing nails.
And some tacks.
A piece of tin about 3 in. wide and 4 ft. long.
Some common hay-baling wire, length of which depends on the tree in which coop is to be hung.

HOW TO PROCEED WITH THE WORK.

The first thing to build is the frames for the ends and partitions. For these take the 1x6 in. board (or any other ⅞ in. lumber of sufficient length) and rip into 1¾ in. strips, of which you will need about 30 lin. ft. Take these strips and cut into the following pieces: three 4 ft. long, three 2 ft. 8½ in. long and six 18 in. long. The latter for the uprights, the middle ones for the horizontal pieces and the 4 ft. pieces for the sides and ridge.

Now take the 10 ft. piece of the ½x4 in. stuff and cut three lengths out of it 3 ft. long. Locate the center of these and then slope the upper edge down each way toward each end, doing the same on all three pieces until you have a good slope and only about a 2 in. or less wide end on each piece, leaving only sufficient width for nailing securely without splitting. The slope needs only to be enough to drain water readily. So the water will not stand on top and warp the roof boards all out of shape, leaving the birds unprotected.

Now place the 2 ft. 8½ in. pieces between the 18 in. uprights as shown most clearly on the Cross Section, though also indicated on the other Drawings, and nail securely with the 10 d. finishing nails, as shown, and then nail one of the pieces of boards, that are sloped, called "gable boards" on the Drawings on one side, placing it in such a position that the top of the 18 in. pieces will be flush with the top edge at the bottom of the slope of the gable boards, or, if you wish, place them so that the end of the 18 in. pieces will have to be sawed off with the slope. After the first frame is ready with square corners at the bottom and conforming to the Drawing, nail up the other two frames in the same manner, making all three exactly the same size.

Take one of the frames and nail fast the laths on it for the center frame, as shown on the Drawings, placing them on the same side as the gable board and set them about 1¼ or 1½ in. apart, as indicated by the Drawings. Cut these laths off flush with the edge of the frame. If you wish you can nail the laths on the other two frames for the ends, but this had better be done later, on account of the door and trough.

Set one of the end frames up with the gable board out and nail fast one of the 4 ft. 1¾ in. strips, placing the end of it so that it will be flush with the outside face of the gable board, then nail the other end frame fast in the same manner and place the center frame in the middle and nail solid and then put on the 4 ft. strip on the other side and nail fast, holding the frames solid. In doing this work, take care that all is perfectly square and straight, so the coop will be built in a workmanlike manner. The strips on the sides are to be set with their upper edges flush with the upper edge of the frames and then planed off to a bevel so the roof boards will have an even bearing on each side.

Now nail a couple laths one on each side at the bottom of the frames, holding same rigid while putting the remainder of the laths on the side. Space these evenly so as to make a neat job, and about 1¼ in. apart, as shown on the Elevation. Let these project over the end frames equally, which extra projection is to be cut off as described later.

Nail the laths on the bottom in the same manner, spacing them evenly and keeping all perfectly parallel, nail all the laths solidly, especially these on the bottom which have to bear the weight of the hens, and do not use any rotten or inferior pieces of lath. Nail the laths on with the 3 d. fine nails.

All the laths are now on except the front, but before placing these build the feed troughs, or, if you wish, put on the roof as described later, to suit your own inclination.

The boards for the feed trough can be of any ½ in. or even thinner stuff, just so it is heavy enough to nail into. The list of materials provides for a 12 ft. ½x4 in. board, so you can take it and cut four lengths 2 ft. 7⅝ in. long off of it. Dress two of these down to 2½ in. wide and one 3 in., or, if you wish, make them just of a size to fit nicely between the edges of the ends which are to be made of the same size stuff, although the above sizes will make a trough amply large. Now take the piece left off of the end of this 12 ft. piece and the 1 ft. piece left off from cutting the gable boards and cut four 6 in. lengths for the trough ends.

Now nail the 2½ in. and 3 in. boards together, placing the 3 in. pieces over the edges of the 2½ in. pieces, so both the sides will be the same. Nail up tightly with the 4 d. nails so all will be tight. Nail the ends on so that the trough will set as shown on the Drawings, nailing these also up tight. Now place these troughs as shown on the Drawings at the proper height, nailing the extending ends of the end pieces fast, as shown, doing all in a workmanlike manner.

After the troughs are secured prepare the two sliding doors or coupled laths as shown on the End Elevation, and on the other Drawings. These laths to be about 3 ft. 1½ in. long, and about 1½ or 1¼ in. apart, and nailed rigidly together. Place these in position on the end the proper height from the trough and nail some pieces of lath or blocks between the laths on the corner posts of the frame, after cutting off the projecting parts of the laths that interfere on the side on which the door is to open. While nailing on these blocks, nail the lath above the door and the two under the trough into position, nailing all solidly and notching the lath that comes into contact with the ends of the trough so as to get a neat job.

After the doors operate easily between the pieces of lath or guides, nail fast the vertical pieces of lath on the corners, which fit in place and nail securely. These hold the coupled laths from coming out and form pockets for the ends of them to slip into, all as shown on the Drawings. Both the ends are to be the same. All the laths are to be nailed on with 3 d. nails. Just before putting on the vertical corner laths, saw the projecting corners of the side laths off flush with the face of the blocks and end laths, and then nail the vertical lath so it will project out and cover the ends of the side laths as shown in the Isometric Sketch "Enlarged Corner of the Coop," and when the sliding coupled laths operate readily, on both ends, the lower parts of the coop are done.

Now take the 4 ft. by 1¾ in. strip that is left and cut it into two pieces, fitting each one between the gable boards to form a ridge, as shown on the Section. Fit these in tightly, but not so tight that they bulge the gable-boards. Nail them in solidly, keeping their edges even with the top of the sloping boards, so that the roof boards will all lay perfectly straight and fit snugly with the slopes on the gable-boards.

When the ridge is in take the five pieces of 10 ft. ceiling and cut into thirty 1 ft. 8 in. lengths and place in position with the upper end resting on the ridge and the lower, projecting as far as it will, on the strips at the sides. In nailing these fast, it would be a good idea to blind-nail them, that is, to drive a nail in slanting in the corner formed by the tongue, through the board into the strip, so that the groove of the next board will cover the nail head, but if you wish just plain nail them solidly in place, using the 4 d. nails. In placing these boards be careful to get them together perfectly tight and so that the projection on one end will be the same as the other, and make the ends all straight and even.

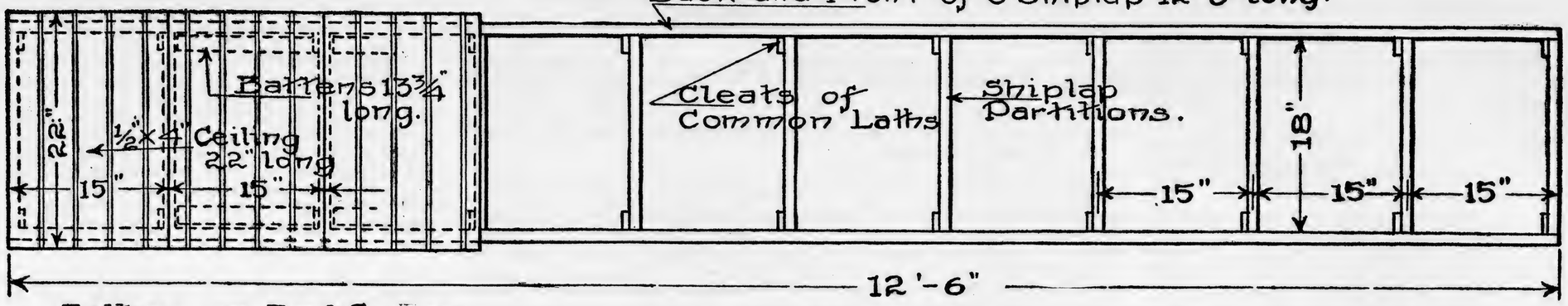
After the roof boards are all solidly nailed in place, bend the 3 in. strip of tin you have provided over the joint, down the center over the ridge, being careful to get it straight and the same on both sides and tack it fast. That completes the coop, all except whitewashing and hanging.

This coop does not necessarily need to be painted or whitewashed, but it would improve its looks and very much increase its lasting qualities. Mix the whitewash of fresh lime and water and coat all of the interior and exterior except the inside of the feed trough with it, filling all the cracks inside and out. If you use oil paint, go over everything in the same way, making a very neat appearing and substantial coop.

After the paint is dry, or if you wish, do this before the coop is painted or whitewashed, proceed to hang it. Bore or punch with a nail two holes in each corner, as shown on the Plans and through these pass the wire that is to support the coop, wrapping it around the corner posts as shown on the Elevation, so the weight will come on them and not on the roof boards.

Select a low tree with wide spreading branches to hang this in, using a piece of 2x4 or other lumber as indicated in the Thumb Sketch if the branches are not arranged just right. Wrap the upper ends of the hanging wires around the tree branches, padding them so as not to injure the tree; and hang the coop as near level as possible. Use strong and pliable enough wire so that the swaying of the coop will not break them off and precipitate the coop, birds and all onto the ground.

When the coop is properly hung and the paint or whitewash is dry the coop is ready to break up your broody hens.

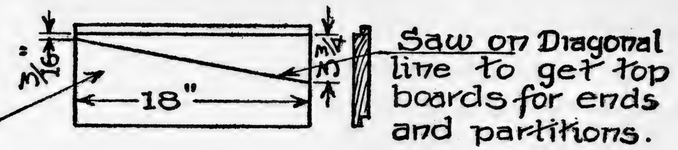


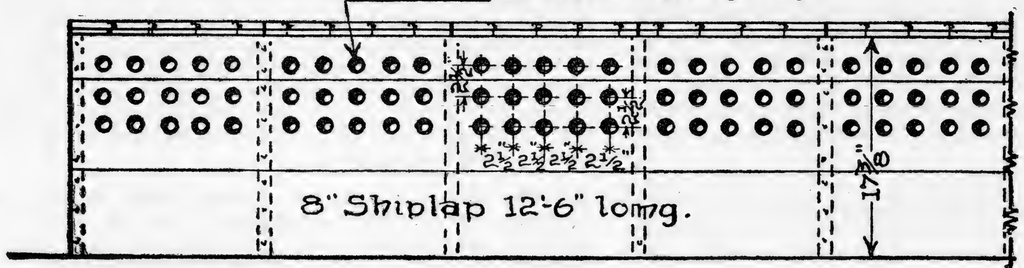
Battens on End Covers to be 13" long.

Battens may be of any scrap, about 1½" Wide ½" or ⅞" thick.

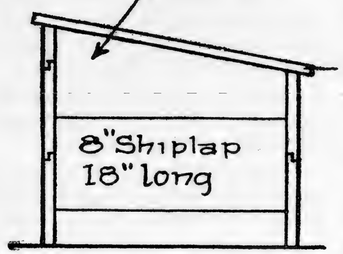
° PLAN °

° Showing ° three ° Covers °
° in ° place °

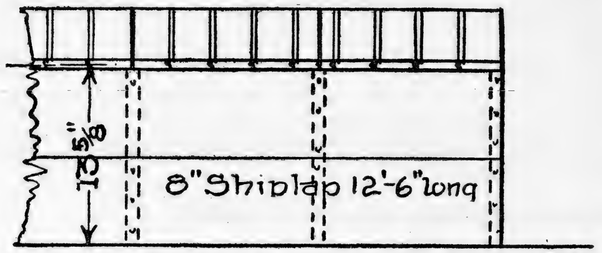




° HALF ° FRONT ° ELEVATION °

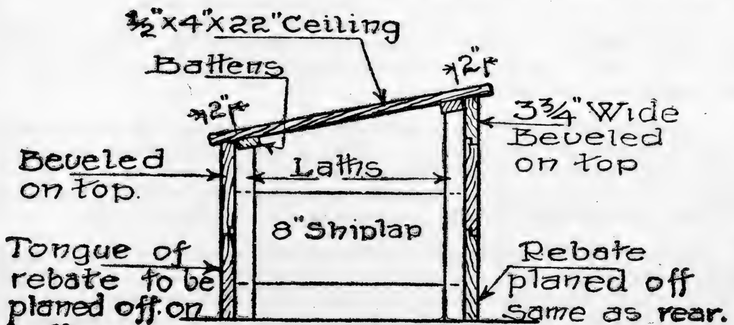


° END ° ELEV. °

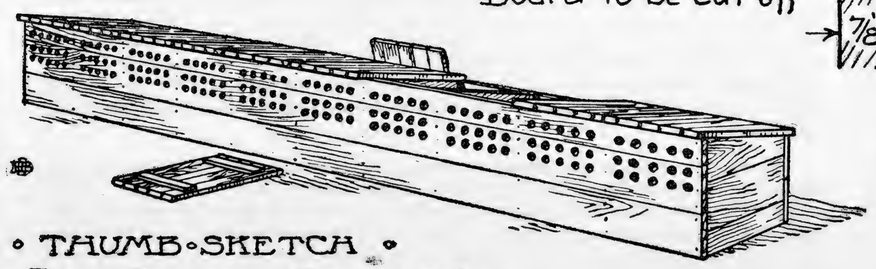


° PART ° of ° REAR ° ELEV'N. °

Center Line.

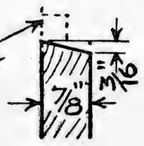


° SECTION °



° THUMB ° SKETCH °
° Two Covers Removed °

Top of Rear Board to be cut off



Showing bevel on top of shiplap.

KELLERSTRASS PLAN OF

SETTING HEN COOP

AS BUILT ON
THE KELLERSTRASS FARM,
KANSAS CITY, MO.

Scale 12 in. 0 1 ft.

PLATE · I ·

SETTING HEN COOP

IN GENERAL.

This coop can be built of any kind of lumber you may have around your place, provided it will work and cut up all right to the sizes shown on the drawings and as described in the description hereinafter.

This coop does not necessarily have to have spaces for ten setting hens, but may have more or less (as you may require) to suit your needs. Whether 5 or 10 or 15 compartments in length, the typical details and work will be the same, although the materials will vary accordingly, so if you make it more or less than the length shown on the drawings, decrease or increase the amount of the material in the following lists, proportionately.

BILL OF MATERIALS.

8 pieces of 1x8 in. Shiplap, 14 ft. lengths.
10 pieces of ½x4 in. Ceiling, 10 ft. lengths.
8 pieces of ½x4 in. Ceiling, 12 ft. lengths.
1 dozen Laths and about
25 lin. ft. of about 2 in. wide strips for cleats.
1 lb. 8 penny (d) nails.
¾ lb. 4 penny nails.
¾ lb. 3 penny nails.

HOW TO PROCEED WITH THE WORK.

The boards for the front and rear are to be prepared first, so take five pieces of the 14 ft. shiplap and cut them off to a length of 12 ft. 6 in. as marked on the Drawings. Then take one of these pieces and rip it in half or into two 3¾ in. wide strips, which includes the lip of the rebate on the edge. Then bevel the top of one of these pieces off, as shown in the Detail, and be sure and get this sloping in the correct direction, as shown on the Section. Off of two more of the pieces, rip or plane off the bottom projecting lip or tongue of the rebate, being sure to get the correct lip on the right piece as shown on the Section. Take one more of the pieces and plane the rebate off the top of it and bevel it as shown and indicated on the Detail. This leaves only one piece with both rebates on.

The pieces for the ends and partitions are to be cut next, so take the remaining pieces of shiplap and cut twenty-three pieces 18 in. long. Take the 3¾ in. strip left from cutting the front piece of that size, and cut it into nine 18 in. lengths, and then take one of the other 18 in. lengths and split it, to get two more pieces 3¾x18 in. These half pieces of shiplap are to be used at the bottom of the partitions and ends, as shown on the End Elevation and Section.

Now take the eleven pieces of the full width shiplap pieces 18 in. long and cut them off on the diagonal shown on the Detail, "showing how to get same," for the top pieces. Be careful in cutting these, so to get the slope slanting in the right direction, and the right pitch, as shown by the measurements, and make all the pieces exactly alike in size. When these are cut, it leaves eleven pieces of shiplap 18 in. long that are full width.

Using the laths for cleats, nail the ends and partitions up. Place the narrow piece of shiplap at the bottom, the full width piece above and the sloping piece on top, all as indicated on the Drawings, and placing the pieces of the laths along the edges, securely nail with 3d nails, taking care to place the laths so they will be on the inside, as shown on the Drawings; one space or compartment having cleats in all four corners, the balance in only two. When you get all eleven partitions nailed up in this way, you are ready to nail the coop up.

Place the two end pieces the correct distance apart, and nail the bottom-front and rear pieces of shiplap on, keeping the bottoms all flush. Then put on the upper-back, the middle-front and the top-front pieces, and nail them fast. Now put in the partitions, spacing them 15 in. to centres, as shown on the Drawings, and nail solidly. Be sure and have all square and set perfectly vertical and evenly spaced. The top pieces should all be flush on top, and if they are not so, plane the upper edges off until all are flush and slanting back, at the same rate. Use the 8d nails for nailing these up.

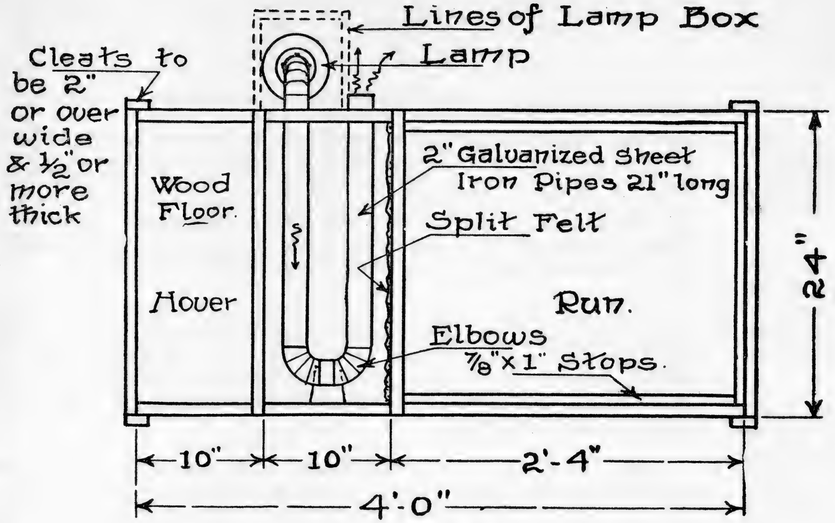
You could nail this coop up without the use of the cleats or laths on the partitions, if you so wished, for the boards are so placed that it would hold itself together, once they were nailed solidly. To do this, place the 3¾x18 in. boards between the front and back boards with their bottoms flush and even and nail fast, being careful to get them perfectly square and straight, and spaced according to the measurements on the Drawings. Then after these are nailed in, place the full width 18 in. boards and nail them in, then place the middle board across the front and the top-back board and nail them, and then put in the sloping 18 in. boards and the front top board, and when all is solidly nailed and straight and square it will be as good a job and perhaps neater looking than the other, although the other way is the simplest to build. It would be desirable to put cleats in the outside four corners, to help keep the ends of the long boards from splitting.

After the coop is nailed up, space and mark off on the front for the holes, spacing them about as shown on the Elevation, 15 holes to each compartment, and then bore these with a 1 in. bit. Be sure and get these in straight lines or else it will give a very crooked appearance to the front. These holes could be put in before the coop is nailed up, but it would be harder to space the holes.

The covers are to be made up next. They are each 15x22 in., made as shown on the Drawings. Take the ½x4 in. ceiling, and cut sufficient 22 in. lengths to do the work. The cleats can be made from any waste lumber, and may be ½ to ⅞ in. thick, and from 1½ to 2 in. or a little more wide, and will be 14⅛ in. long if the coop is nailed up without cleats, and about 13⅝ in. long if with cleats. Nail up one cover at the time, so that all strips and pieces ripped off in sizing or fitting can be utilized. Place the cleats on the back, about 2 in. from the ends, and in the center of the width, so the covers will just fit nicely, and put the cleats on all the covers the proper or the same distance from the edges, so that the ends of the ceiling will all line up nicely across the front and back. Fit the covers on so they set as indicated on the Drawings, making a workmanlike job. Use the 4d nails for this, and, if you wish, blind-nail the work.

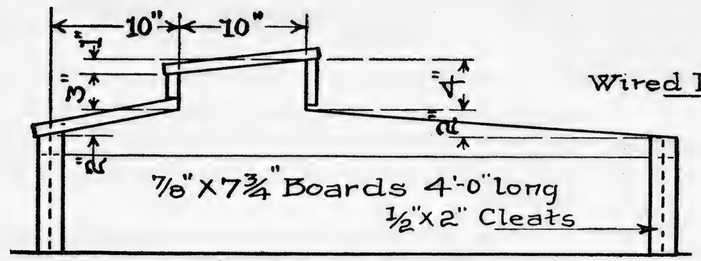
When the covers are done and on, the coop is ready unless you wish to whitewash it or creosote it. A good idea would be to coat the interior with creosote or crude carbolic acid, and whitewash the exterior, but this can be done not at all, or any time when you have the inclination.

Set it on level dry ground, or on a floor, and prepare the nest with hay or straw, and the coop is ready for housing the setting hen.

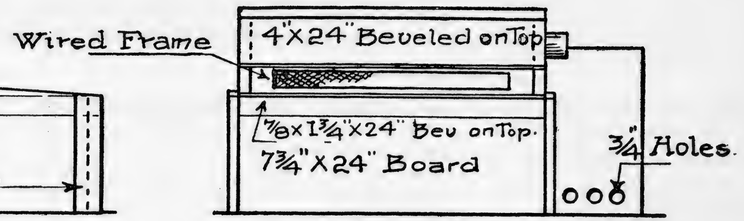


• PLAN •
• with • Covers • for • Hover • and •
• Run • removed •

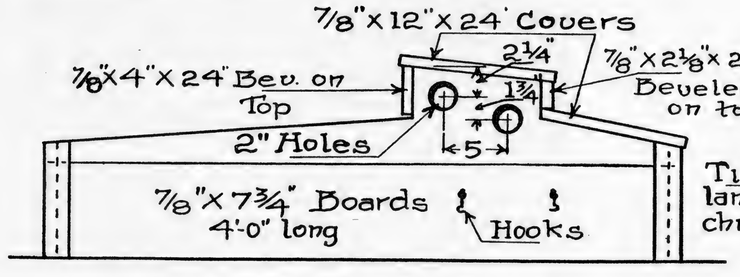
Runway to have interchangeable Covers using a 22"x28" Frame, covered with poultry wire or a 22"x28" Sash for cold weather. Sash glazed 18"x24" divided 6 Lts or 4 Lts according to which is easiest to obtain.



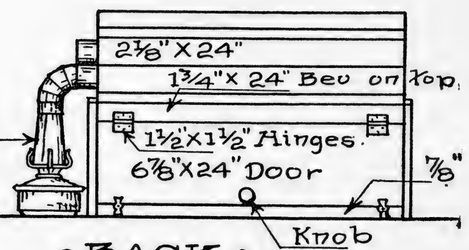
• RIGHT • SIDE •
• Giving • Measurements • for •
• cutting • top • Board •



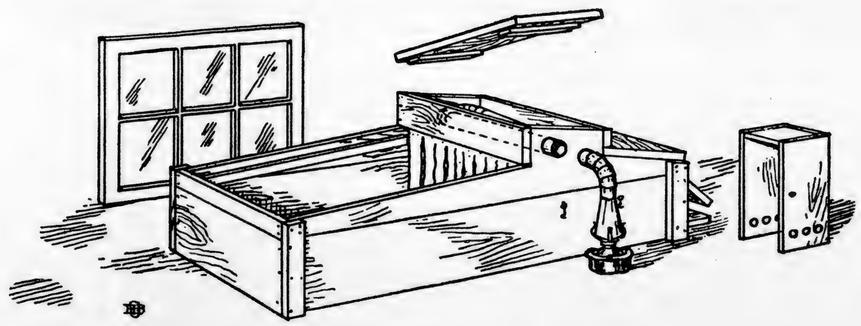
• FRONT •
• Showing • Box • Covering •
• lamp • in • Position •



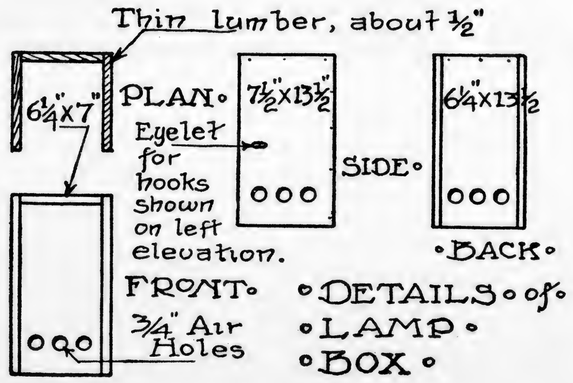
• LEFT • SIDE •
• Showing • Holes • for • Pipes •



• BACK •
Showing • common • lamp
• in • use •



• THUMB • SKETCH •
• Showing • upper • cover • and • Sash • removed •



KELLERSTRASS PLAN OF
FIRELESS OR HEATED
BROODER
AS BUILT ON
THE KELLERSTRASS FARM.
KANSAS CITY, MO.

Scale 12 in. 1 ft

PLATE • I •

THE KELLERSTRASS WAY OF BUILDING

FIRELESS OR HEATED BROODER

IN GENERAL.

The illustrations on Plates I and II show this Brooder and all parts of it completely, so you should not have any trouble in building it, even if no description was given.

The most of the material in the following List or Bill can be found in any farmyard or suburban yard, so the Brooder ought not cost very much. The 1x12 in. and ½x8 in. boards, and possibly some of the 1x8 in. boards, can be gotten out of common boxes or scrap lumber, and the other strips necessary can be gotten out of any lumber that you may have laying around. The sash can be any odd size, just so it can be built up or trimmed down to fit, although, of course, the best appearing job will be gotten by using the size called for. The same can be said of other articles or items mentioned in the list below. The poultry wire and piece of tin, nails and other light hardware, etc., can generally be found around the place, so if you bunch up the articles you have around, you will find you will not need to purchase very much material, thus making your Brooder cost next to nothing.

The description, following the Bill of Materials, will describe how to go about to cut and put together the materials listed, but it will be an easy matter to work your miscellaneous material in, if you watch the Drawings and Description closely, and note how one piece of board could be replaced by another of similar shape and size, but unlike in other ways; and how one article could be replaced by something else, though different, that would serve the purpose in every way.

BILL OF MATERIALS.

2 pieces of 1x8 in. No. 1 sheathing boards, 12 ft. lengths.
Get these as near full to width as possible.
1 piece of 1x 8 in. board or shiplap, 6 ft. long.
1 piece of 1x12 in. board, 4 ft. long.
1 piece of ½x 8 in. board, 4 ft. long.
1 sash 22x28 in. x 1⅜ in. thick, with 18x24 in. gl. div. 4 lts.
1 piece of tin, 10x6 in.
2 pieces of 2 in. galv. iron conductor pipe, 21 in. long.
3 good square elbows for same.
1 piece of 1 in. mesh Poultry Wire, 18x24 in.
1 piece of heavy Felt, 20x24 in.
1 piece of Leather Strap about 5 in. long, or a couple Wire handles.
5 Knobs of porcelain or metal.
2 1½x1½ in. hinges with screws.
2 small sash Buttons or turns.
2 small wire Hooks and Eyes.
¾ lb. of 8 penny (d) nails.
¼ lb. of 4 penny nails.
Some 3 penny fine nails.
2 4 in. long nails.
50 small staples.
1 Lamp and Burner (any common kerosene lamp will do).

HOW TO PROCEED WITH THE WORK.

Commence building this Brooder by preparing the lumber for the sides and ends, etc. Take the 12 ft. pieces of 1x8s and cut four lengths 4 ft. long and four pieces 2 ft. long. Take two of the 4 ft. pieces and mark off for the upper pieces of the sides, as shown on the Right Side Elevation on Plate I, making the hood for the heating pipes and the slopes exactly as shown, and make both sides alike. Take two of the 2 ft. pieces and rip a 1¾ in. strip off of each, and then, out of the pieces left, rip a 4 in. and a 2⅛ in. wide strip. Bevel the top edges of these four strips, as shown on the Details on Plate II for A, D, and C, B, respectively, as they are marked on Section X-X, Plate II. Take one of the pieces remaining from cutting the upper side pieces and cut a strip 2¼ in. wide x 24 in. long for the notched strip under the door in the rear, as shown on Section X-X. Cut a notch in each end, as shown by the Detail, to which the arrow points, which notch is ⅞ x about 1⅜ in, but, instead of the measurements marked, measure the thicknesses of your boards (which will most likely fall shy of ⅞ in. unless they are full to measure or in the rough) and use them instead, in the same manner as shown on the Drawings.

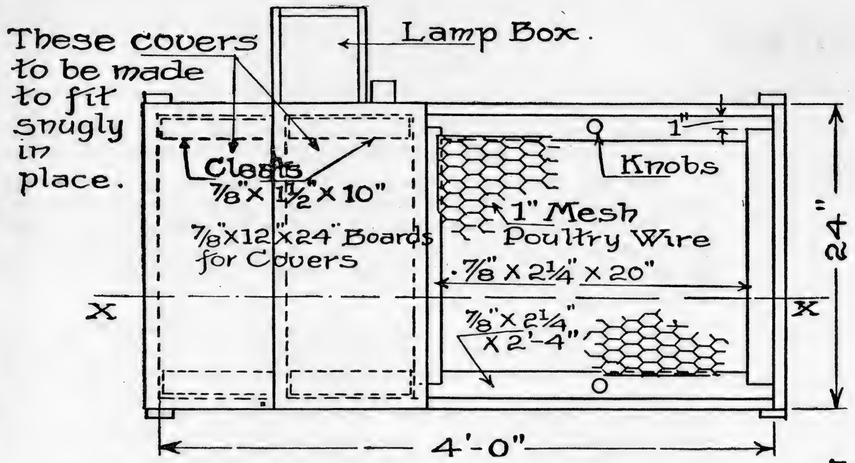
Now take the two 4 ft. pieces and the 2 ft. piece that have not been cut, and nail them and the notched piece together. Place the 2 ft. piece over the ends of the 4 ft. pieces with the ends of the shorter piece, flush with the side of the side pieces, as shown on the Plans, and nail solid. Then turn it over and place the notched piece as indicated in Section X-X and nail it fast.

Now take the two 4 ft. pieces that have been cut for the top sides, and the two 1¾ in. pieces A and D and nail these together, placing the small pieces on the ends of the 4 ft. pieces as indicated on the Drawings, being careful to get the pieces on the right ends, for the slopes differ. Nail both these parts, the lower frame and the upper frame, together with 8d nails, being careful to keep them square and true.

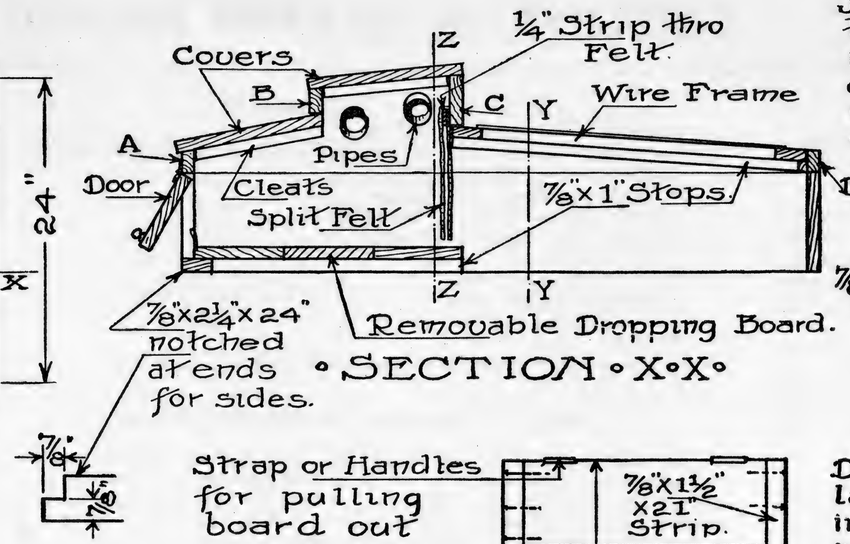
Now take these two frames as they are nailed together, and place one on top of the other as shown on the Drawings, and if you have long enough nails, you will not need the cleats, but can make the two solid without. But if you use the cleats, which will probably make the stoutest job, nail them on so the outer edges will be flush with the ends and place them so that the lower ends will be flush with the bottom of the frame, and then cut them off on top, with the slope of the top, as shown. These cleats to be 2 in. or over in width and ½ to ⅞ in. thick, and will be about 9½ in. long.

The outside frame is now nailed up, but before placing the pieces B and C on the hover hood, fit the covers in place. Take the 1x12 in. board and cut it to two 2 ft. lengths. Fit these in place, bevelling the edges until they fit and set right. When the lower or back cover fits all right place the 2⅛ in. and 4 in. pieces B and C in position and nail fast, and if the tops are not flush with the slope of the top edge of the sides, make them so. Out of any scrap material get four cleats that are about 1½ in. wide and 10 in. long of almost any thickness under ⅞ in. and fit and nail them on the under side of the covers so that they will hold the covers in places over the hovers, as shown on the Drawings.

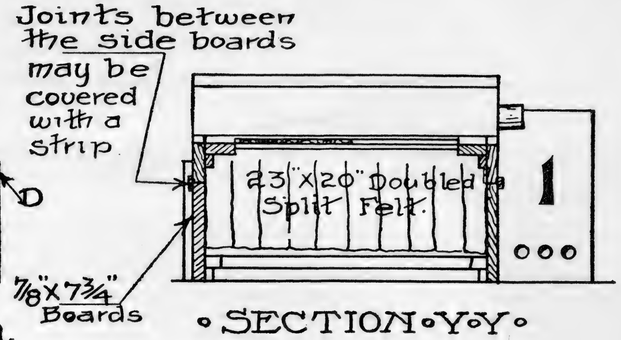
When the covers fit snugly, make up the removable floor or dropping board. This is composed of three boards 19 in. long, making a combined width of 21 in., and two 1½ in. strips, as shown on the Plan of Floor on Plate II. Get these three boards out of the 6 ft. piece of 1x8, trimming one or all down, so as to get the proper width. The two ⅞x1½x21 in. strips can be gotten out of scrap pieces of lumber, and then nail all together as detailed. Now cut a couple strips ⅞x1 in. or ½ in. for the stops under the dropping board and nail these in as shown, and then fit the board in place, planing it off till it fits



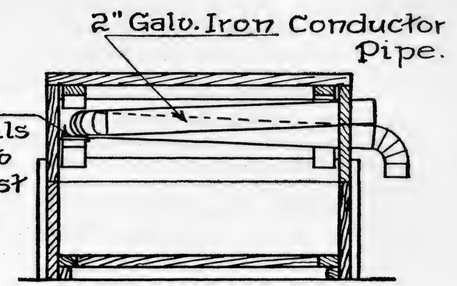
• PLAN •
·Showing·Wire·Frame
·and·Covers·in·place·



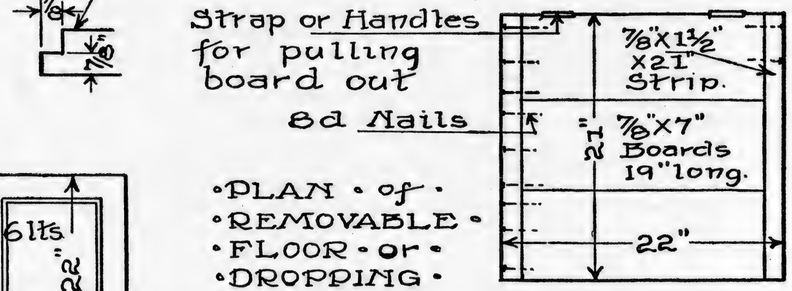
• SECTION • X • X •



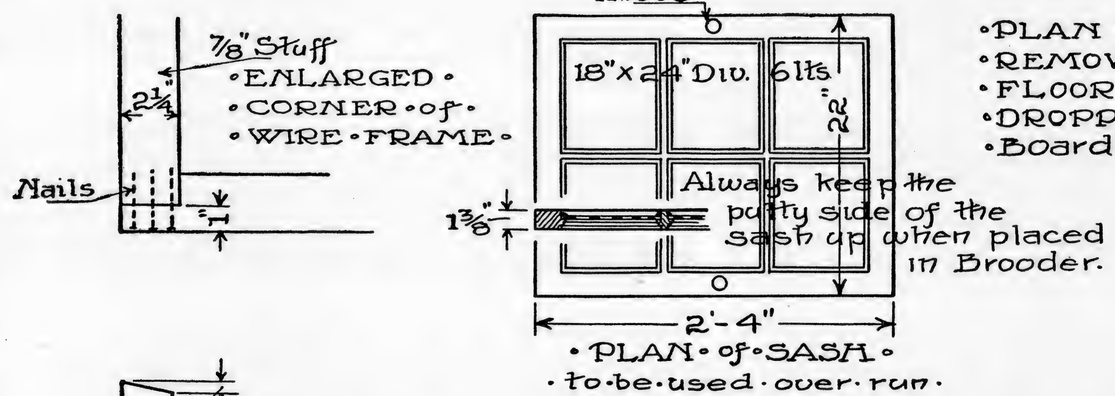
• SECTION • Y • Y •



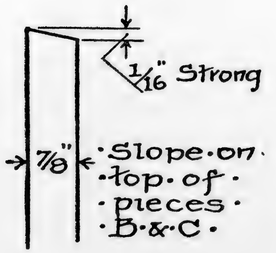
• SECTION • Z • Z •
Showing·Heating·Pipes

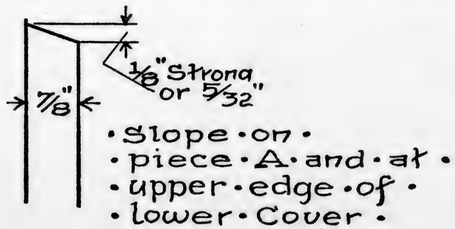


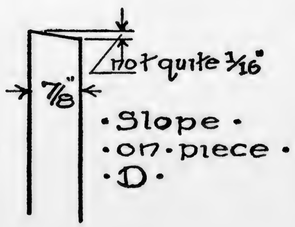
• PLAN • of •
• REMOVABLE •
• FLOOR • or •
• DROPPING •
• Board •

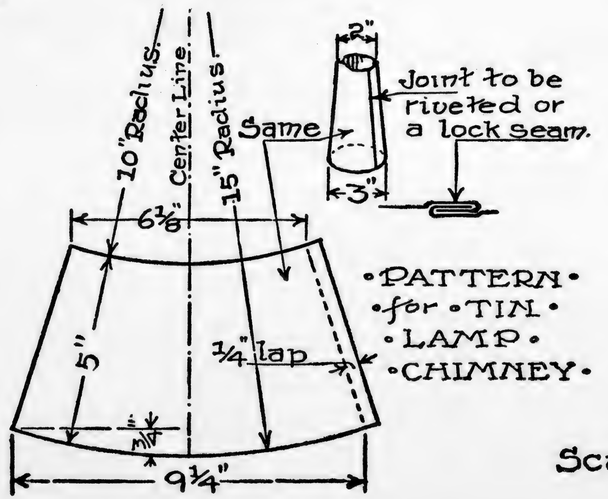


• PLAN • of • SASH •
· to·be·used·over·run·









• PATTERN •
• for • TIN •
• LAMP •
• CHIMNEY •

KELLERSTRASS PLAN OF
FIRELESS OR HEATED
BROODER
AS BUILT ON
THE KELLERSTRASS FARM
KANSAS CITY, MO.

Scale 12 in 0 1 ft

PLATE ·II·

snugly, though moving out and in readily. Take the strap or the wire handles provided and put on the back edge of board, notching the board to receive them. If you use the strap, cut it in half and place one on each side, as indicated on the Drawings, so you can get a hold of them to pull the board out. After these straps or the handles are on, the board is ready

Now take the 1x8 in. x 2 ft. board left and fit it in the back for the door, as shown on Section X-X and indicated on the other Drawings. Fit this so that it will go in snugly and then put on the two hinges, the buttons or turns, and the knob, as shown on the Back Elevation on Plate I. Place the hinges square and on a line, so the door will open properly. The door is to fit between the corner cleats.

Out of the larger pieces left from cutting the top sides, rip some 2¼ in. wide strips, which cut into two lengths 2 ft. 4 in. and two pieces 20 in. long, for the wire frame. The remaining pieces can be used for cleats, so it might be a good idea to cut these frame pieces immediately after the sides are cut or nailed up, so as to have all the scrap lumber possible available for the cleats. After these 2¼ in. strips are cut to the desired lengths, with square ends, dress the edges and then cut notches in the two longer pieces, as shown on the Plans on Plate II, showing the wire frame, and on the Detail on the same Plate. Then place these members together and nail solidly, being sure to keep all the corners square. When the frame is solid, stretch the 1 in. mesh poultry wire over it and secure it with small staples driven about 4 in. apart. Fit this frame in place so it will fit snugly, as indicated on the Drawings, and place the two knobs on, as shown, to make it easier to handle.

Before fitting the frame in place, cut some ⅞x1½ in. or 1 in. stops and nail around the inside of the run, as shown on the Drawings, placing them ¾ or ⅞ in. down from the top, so the top of the frame will be just flush with the top edge of the sides and front. Nail these stops fast with 3d nails.

After the wire frame is properly fitted, fit in the sash, dressing it off until it fits under the piece C snugly and fits between the sides and front nicely. This sash will project a trifle above the edges of the sides and front. Place the two knobs on top as shown and the sash is ready. Keep the puttied side of the sash up so the glass will bear on the wood and not on the putty.

Now bore two 2 in., or a trifle over, holes for the 2 in. galvanized pipe to pass through (using an extension bit) in the left side. Place them as shown on the Elevation, the rear one being low, and the front hole high. This is done so the pipes will slope up from the lamp, so the heat created by the lamp can travel upwards at all times and in the direction indicated by the arrows on the Plan on Plate I. The slope of the pipes are shown on Section Z-Z. Bore the holes with a slight inclination upwards or downwards, so the pipes will fit snugly all around, making tight joints.

Before placing the pipes, nail fast the split felt over the opening between the hover and run. Take the felt you have provided and cut it to fit in tightly between the sides and be about 20 in. long. Fold it over, thus doubling it, and cut the slits in it about 2½ in. apart, as indicated on Section Y-Y, and then pass a ½ in. or less strip through it and nail or tack it fast, as indicated on Section X-X, with the bottom edges touching the removable dropping board, or nearly so.

When that is done, insert the pipes, passing them in through the holes in the sides, and place two elbows on the inside ends, as shown on the Plan, connecting them. Place these elbows so that there will be an equal slope on the two pipes, the rear one sloping up to the elbow, and the front one sloping up from the elbow to the outside, as shown on Section Z-Z, and as mentioned in the previous paragraph. Drive a couple of long nails in the side to hold up the elbowed ends of the pipes, as marked on the Section, or, if you wish, cut a ½ in. strip of tin and bend around the pipe and fasten to the side, but the nails are much easier to put in and will do the work required of them. Be sure and get both pipes sloping about equally. These pipes are to be common 2 in. plain round galvanized down-spout or conductor pipe.

Now put the elbow on the outside, on the end of the lower pipe, placing it on so the bottom opening will be about horizontal. Then place the lamp you have provided, which should of course be low, as indicated on the Drawings, and measure the distance from the place where the chimney sets to the bottom of the elbow, and make the chimney a trifle longer so it will pass up into the end of the elbow. This length should be about 5 in., but if it isn't, try to make it so, or change the height of the pattern for the tin chimney so it will fit all right.

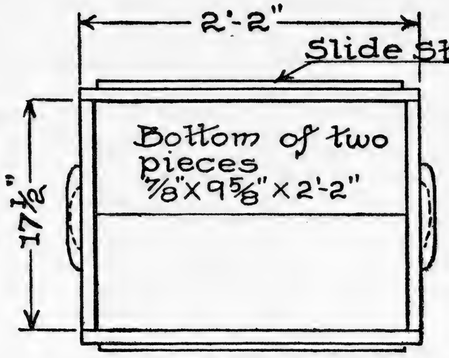
The pattern for the tin chimney is shown on Plate II, so take the piece of tin provided, and lay the pattern out on it, and then cut it out. Roll it up until the small end will fit snugly into the 2 in. pipe and the large end will fit on to the burner of the lamp, and then rivet it together, or, better still, join it with the lock seam, which is shown by the Detail. Hammer this down tightly, and the chimney is ready. If you wish, you can take a common baking powder can and bend it in at the top, so it will go into the 2 in. pipe and be about the shape shown on the Drawings. This will be every bit as good, if you get the joints tight, as the other tin chimney. The tin chimney is used so there will not be any breakage of glass chimneys.

When the lamp and chimney parts fit all right, take the ½x8 in. lumber and build a box to go over the same, as shown on the Drawings. This is thoroughly detailed on Plate I. Nail the pieces together with 3d or 4d nails. If your lamp is so large that it will not go into the box shown, make the box larger, but build it in the same manner as detailed. Bore the holes in the side and back as shown to let air in to the lamp, and then place the box over the lamp and pipe, as shown on the Drawings, and place the two small hooks and eyes in position to hold it solidly in place.

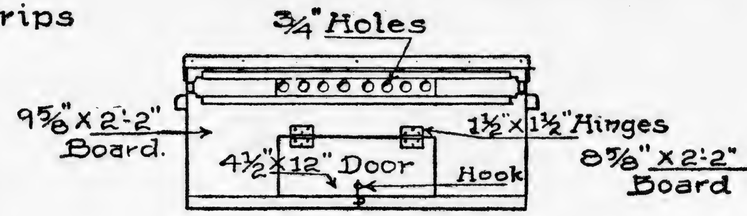
If you wish, you can place some strips over the joints between the side boards, making them tight. If these are put on, notch the lamp box over the one on the left side.

When all is done in a workmanlike manner, and all fits snugly, and presents a neat appearance, the Brooder is done, unless you wish to paint or creosote same; painting the outside, and coating the inside with creosote or crude carbolic acid, and let it get thoroughly dry before using.

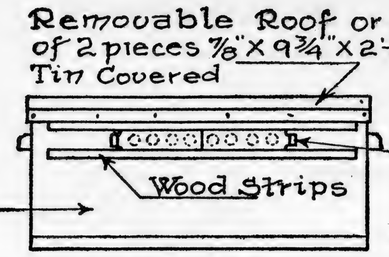
The sash and the wire frame are interchangeable, and are to be used according to the weather, the sash when it is cold, and the frame when it is warm or indoors. When used outside, place the Brooder on a grassy spot, and as the spot is picked clean, move the Brooder to a new place, and when the chicks are old enough to be allowed a free or larger run, open up the door in the back. This door also makes the hover easy to clean, for all you have to do is to open the door, pull the dropping board or floor out, brush it off, and replace it, all being done while the chicks are out in the run, without disturbing them.



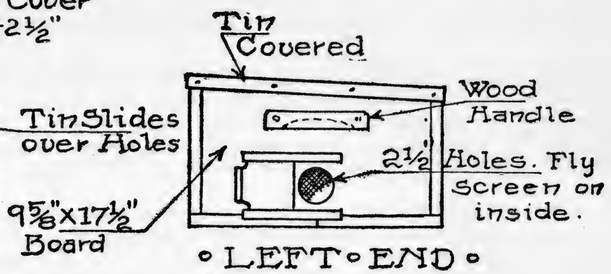
• PLAN •
• With • Cover • removed •



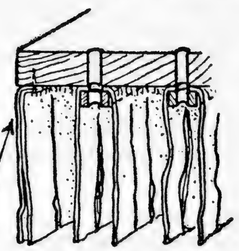
• FRONT •
• Showing • Slides • pulled • out •

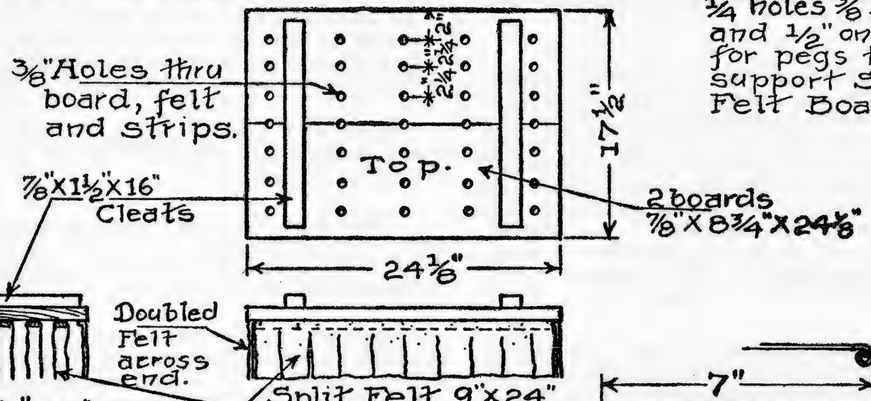


• BACK •
• Slides • Closed •

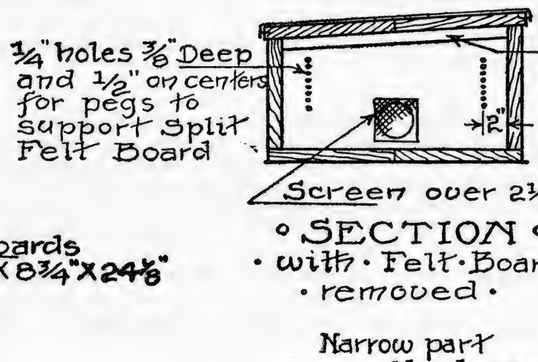


• LEFT • END •
• Slide • Open •

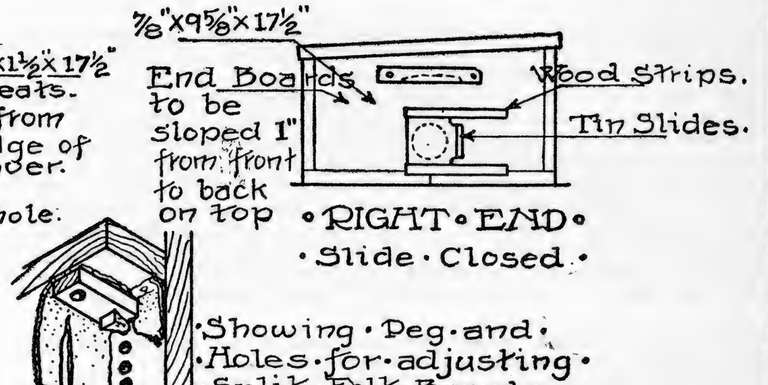




• SPLIT • FELT • BOARD •

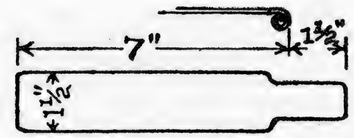


• SECTION •
• with • Felt • Board •
• removed •

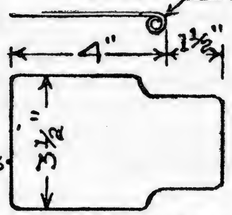


• RIGHT • END •
• Slide • Closed •

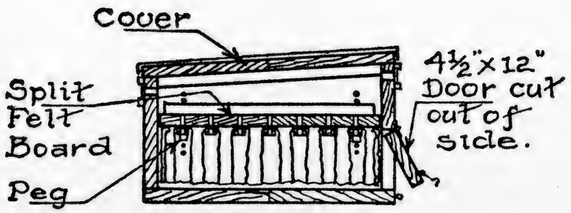
•Showing • Peg • and •
•Holes • for • adjusting •
•Split • Felt • Board •



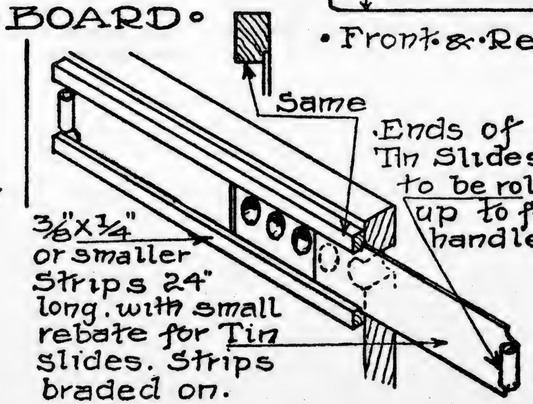
• Front • & • Rear • Slides



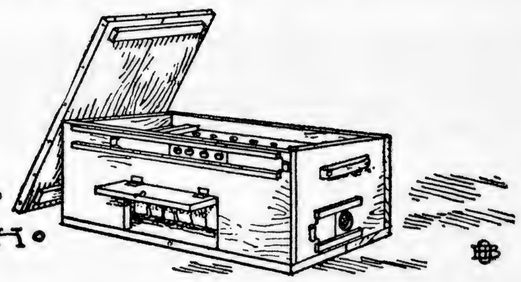
• End • Slides •



• SECTION •
• All • parts • assembled •



• ENLARGED •
• SHOWING • HOW •
• SLIDES • over •
• Ventilating • Holes •
• are • constructed •
Size of Tin are given above.



• THUMB •
• SKETCH •

KELLERSTRASS PLAN OF
FIRELESS BROODER
AS BUILT ON
THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 12 in. 0 1 ft

PLATE • I •

FIRELESS BROODER

IN GENERAL.

The most of the materials for this Brooder can be found about your place, and the Drawings show all parts in full, so you should encounter no trouble in building it.

Instead of making or building the box as shown on the Drawings, you can use any common box that is solid and practically air-tight, and that is about 9 or 10 in. high, and bore the vent openings in the ends, cut the door in the side, and slope the top slightly as indicated by the Drawings, and then make the size of the other parts to fit, using the Details only as being typical; that is, showing the way to do it and the general form of the part, but not the size. By using the box, you will save time, for you will not need to nail it up or purchase the necessary lumber. The other parts can be made to suit the common box as easily as the specially made box. The lumber in the cover, and split felt boards, do not absolutely have to be the thickness shown on the Drawings, so, if you wish, use any box lumber you have around the place.

By using up scrap lumber and other odds and ends you have laying around your place, you can build this Brooder at very slight expense; yes, almost costing nothing, much more than your time.

The following Description and Bill of Materials will take up the Brooder as shown on the Drawings, but, as stated before, any of the specified material can be replaced by other material that will do the work required of it in every respect. If you build the Brooder according to the Drawings, you will be assured of having one that will be entirely satisfactory in every way, and one to which you can point with pride.

BILL OF MATERIALS.

1 piece of 1x10 in. No. 1 board 22 ft. long, or get one 10 ft. and one 12 ft. board, but the latter will require some extra pieces for cleats, etc., while the 22 ft. piece will take care of it all.
1 sheet of Tin 20x28 in. for roof. Instead of the Tin, a piece of Ready Roofing of asbestos or other standard brand could be used.
1 piece of Tin or Galvanized Iron, 14 in. x 7 or 8 in., for slides.,
3 yards of heavy Felt 24 in. wide, or get 2 yards 36 in. wide instead.
2 Hinges 1½x1½ in., or smaller, with screws.
1 small Hook with Eyelets.
1 piece of Fly Screen, 3x6 in.
Nearly ½ lb. or about 70 6 penny (d) nails, and about 40 2 penny nails, and some small brads and tacks.
A little Paint and Creosote or Crude Carbolic Acid.

HOW TO PROCEED WITH THE WORK.

First build the box for which the 1x10 in. board is to be used. Take the 22 ft. piece, or the 12 ft. and the 10 ft. pieces, whichever you have provided, giving preference to the 22 ft. piece, and cut six lengths 2 ft. 2 in., two lengths 1 ft. 5½ in. and two lengths 2 ft. ½ in. These are for the sides, top and bottom, ends and felt board. The remaining piece off of the 22 footer is to be cut up for the cleats, strips, etc. If the shorter lengths are provided, most of the cleats will have to be cut out of other pieces of lumber.

Take one of the 2 ft. 2 in. pieces and plane or dress down to 9⅝ in. and take a second piece of 2 ft. 2 in. length and rip or dress down to 8⅝ in. These pieces are to be slightly bevelled on top, which may be done after the box is nailed up. Take the two 1 ft. 5½ in. pieces and cut a slope on the top edge of them, so that the narrowest end will be 8⅝ in. and the upper or highest end will be a trifle less than 9⅝ in. These two latter pieces are for the ends, and the other two for the front and back. All to be as shown and marked on the Drawings.

Before nailing the box up, take the 9⅝ in. front piece and cut the opening for the door as shown on the Front Elevation. To do this, make two saw cuts 12 in. apart and 4½ in. deep with a very fine saw, and then with a chisel or knife cut or split the piece out, making a neat square cut or break. If you do this in a neat and workmanlike manner, you can use the 4½x12 in. piece cut out for the door, as stated later.

After this door opening is made neatly, take the ends and bore the 2½ in. holes shown on the Drawings, being careful to get them in the center, as shown on the Left and Right End Elevations. Then on the inner side of the end pieces, being sure to get the sides that will face each other, draw a vertical line 2 in. from each end, and then space off equal distances for the adjusting peg holes, and when these are marked off equal on both ends, and in all four places, bore about ¼ in. holes about ⅜ in. deep, so they do not go through, at each point, as shown on the Sections and indicated on other Drawings. Place these holes close enough together so the felt board can be adjusted to any height, and be sure to keep them all level.

If you wish, you can bore the ¾ in. ventilating holes in the front and back, or you can do that after the box is nailed up. In spacing these, be sure and get them in line, and spread out just enough so the tin slides will cover them, which means they will occupy a space not over 12 in. long. Get these down far enough from the top edges so that the guides for the slides can be nailed on. It would be a good idea to wait and bore these holes after the guides are on, so to get them centered properly, so they will present a neat appearance.

When the sides are all prepared, place them together with their bottoms flush, and with the end pieces between the sides as shown on the Plan, and nail with 6d nails, being careful to keep the corners square. After the sides are nailed together, nail the bottom on of two pieces of the 2 ft. 2 in. lengths, placing them tightly together, and plane the edges off if they project beyond the sides, to make a flush job. Now, if the top edges of the sides have not been bevelled, do this, making the top edges all slope properly, so the cover will have a full bearing all around.

Now make up the cover, using the two 2 ft. 2 in. pieces left, securing them tightly together with two ⅞x1½x17½ in. cleats, which can be gotten out of the piece of board left or other scrap lumber. Place these on the back, or under side, in such a position so they will hold the cover solidly on top of the box, which will mean to place them about ⅞ in. in from the outer edges, and about ⅞ or 1 in., depending on the total width of the cover, from each side, and then fit the cleats in between the sides and ends of the box so the cover will fit snugly.

This cover or roof is to be covered with tin or ready roofing, per the Bill of Materials, which is to be put on tightly, with the edges turned down over the edges of the boards or cover, and then tack or nail fast solidly, making a watertight top, which will be found necessary should the Brooder be used outside. If the tin is used, it might be well to paint it on the underside, thus making it last much longer.

The split felt board can be built up next, so you will have the heavier work done. Use the two 2 ft. ⅛ in. lengths for this, holding them tightly together with two cleats, which are to be about ⅞x1½x16 in. long, and which serve the double purpose of cleats and handles for lifting the felt board. When the boards and cleats are nailed together, plane the edges off, until it fits into the box snugly, but so it can easily be lifted out whenever necessary.

Now cut or rip seven strips ¾ in. wide x 24 in. long, and about ⅜ in. thick, and place these on the under side of the felt board, placing the two outside ones so their centers will be exactly 2 in. from the edge, so they will be exactly in front of the peg holes in the ends, as shown on the Sections, and space the other five equal distances apart, as shown on the Drawings; the measurements are given on the plan of the top of the felt board. Nail these in place temporarily with a nail or two apiece, and then bore the ⅜ in. holes through them and through the board, as indicated on the Drawings, and when the holes are all bored remove the strips.

When the wood part of the split felt board is ready, take the felt you have provided and cut into nine pieces 9x24 in. and two pieces 9x17½ in. On the 24 in. and 17½ in. edges cut splits or slits about 3½ in. long and about 2½ in. apart. Two of the 24 in. pieces and the two 17½ in. pieces are to be doubled and tacked on around the edges, as shown on the Drawings, and the other 24 in. pieces are to be doubled, with the strips passed between, and then nailed fast to the felt board. In placing the strips, be sure to set them over the holes properly, and, after all are nailed solidly, cut the holes through the felt, leaving them entirely open. In placing the felt, set it so the bottoms of every piece will be on a line, including the outside pieces, so that all the pieces will touch the bottom or be equal distant from it, as shown on the Drawings. All is to be done as shown on the Details. Now cut a couple of holes or slits in the end pieces of the felt, under the two outside strips, so the pegs can project through, to hold the board up, and still leave the felt along the end hang down.

When this is done, the board is ready to set in place, but before doing so, whittle out the four small wood pegs or plugs, and push into the holes in the ends, so they will project about ¼ of an inch, as indicated on the Drawings, and put the felt board in, letting it go down until it rests on the pegs, which should fit into the holes tightly, so they cannot be jarred loose very easily. When this is satisfactory, the felt board part of the Brooder is done, and the whole can be removed, until the box is ready.

Fit the door in place, using the piece cut out of the side if it fits snugly, but otherwise take another piece of board and make it of a size to fit into the opening, which is about 4½x12 in. Hinge the door with the two hinges provided, placing them on the outside, as shown on the Front Elevation, and be sure and get them on true and in line. Drive the screws in straight, and place the small hook and eye in position as shown, and hook the door fast, while the rest of the work is being done.

Over the 2½ in. holes in the ends fasten the fly screen provided, tacking same fast on the inside, and secure it carefully, leaving no sharp edges or projecting pieces or ends of wire, upon which the wee chicks might injure themselves.

Now take the 7x14 in. piece of heavy tin or galvanized iron, whichever you have provided for the slides, over the ventilating holes, and for the two end slides cut two pieces 3½x5½ in., and for the front and back slides cut four pieces 1½x8½ in. long. Round the corners of these pieces and cut the part for the roll or curl down in width as shown on the Detail, doing all in a workmanlike manner, and then roll these parts up to form handles and at the same time stiffeners. Roll each one up about the same size and until the slides are the length shown on the Drawings.

When these are ready, cut some narrow strips of wood for guides for the slides. These guide strips are to be ⅜ in. x ¼ in., or even smaller if the brads you have provided will nail them on without splitting them. There will be four lengths about 24 in. long and four lengths about 7 in. long of these strips. Cut a small rebate on the inside edge, to take the metal slides, as shown on the Details. This rebate ought not to be very large, but may be fairly deep, for the slides should fit tightly, although not so tight so they cannot be pulled open.

Now locate the 3½ in. slides over the holes in the ends and place the guides in position and brad them fast, being careful to get them horizontal, and to get the holes in the center between them. These are to be placed to one side, as shown on the End Elevations, so the slides will operate correctly. If the ¾ in. holes in the front and back are bored, place the slides and guides on in the same manner as described above, so the holes will be in the center between the guides, which should be placed as shown on the Front and Rear Elevations. If the holes are not in, place the top guide strips next or nearly so, to the upper edges front and back, and then put the slides in, and place the bottom guides in position and brad fast, and then pull out the slides and bore the holes in the center between the guides, spacing them as described in the previous paragraph. In nailing or brading the guide strips fast, be careful not to split them, and nail them tight enough so the slides will fit snugly, but not too tightly.

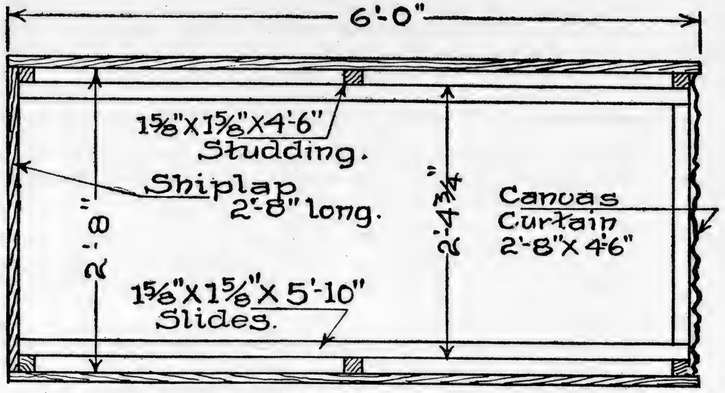
Take two pieces of board about ⅞x1x8 in. and whittle out the two handles for the ends, rounding the top corners and the ends, and cut the lower side out as indicated on the Drawings. Nail these on solidly, so they will not come loose. If you wish, you can put on a couple of wire, or other ordinary drawer pulls, instead of the wood handles.

When these handles are on, and the metal slides are in place, the Brooder is ready for use, unless you wish to paint it, which will add to its appearance and very considerably add to its lasting qualities.

Paint the outside, including the edges of the door and doorways and the top edges of the sides and along the edges of the cover, with oil paint. The bottom should also be painted, and paint the top or cover if it has a tin covering, and if the ready roofing is not pretty to look at, you might coat it. The metal slides on the sides if of galvanized iron do not need to be painted; if of tin, you can paint them if you wish or leave them bright. The color you can choose to suit yourself. Brush the paint out well, so it will not form bubbles or thick places and blister and peel off.

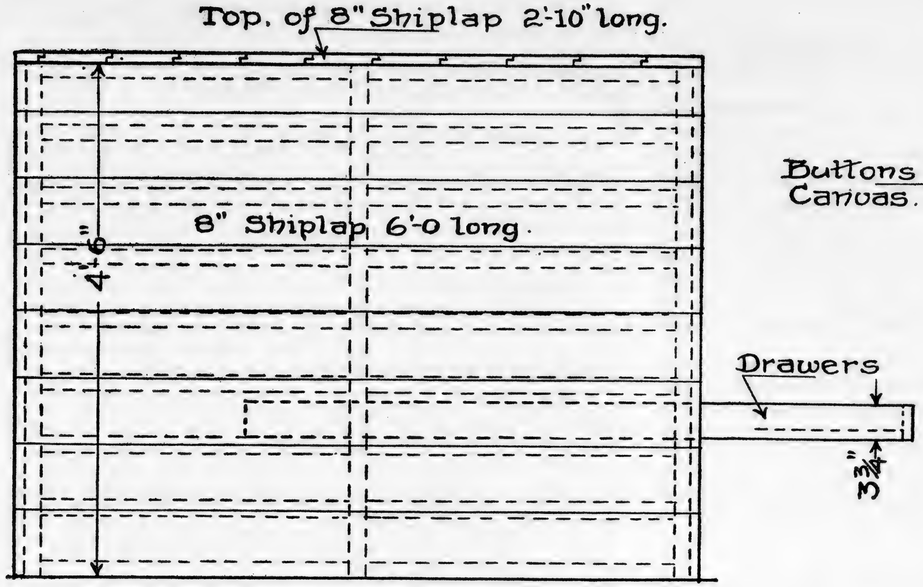
Go over all the wood work of the inside with creosote or crude carbolic acid, saturating the wood thoroughly in all parts. Be careful so as not to get too much of this on the felt.

When all this is thoroughly dry, and all possible odors from the paint, etc., are gone, and all is done in a workmanlike manner, the Brooder is ready for use, ready to do its share toward rearing the wee incubator chicks into strong and healthy pullets and cockerels.



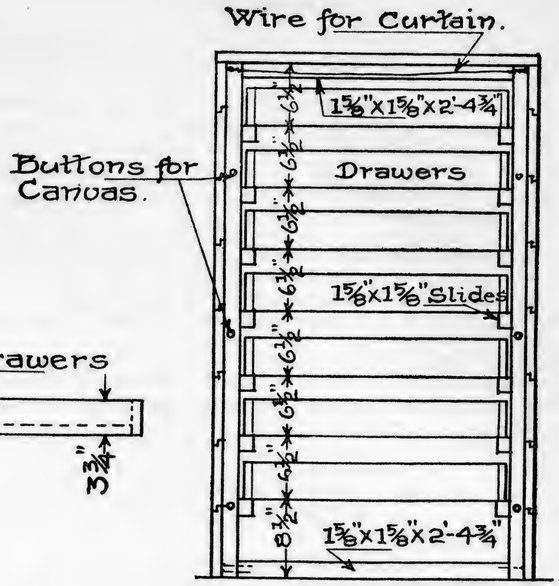
∘ PLAN ∘

· With · Drawers · Removed ·



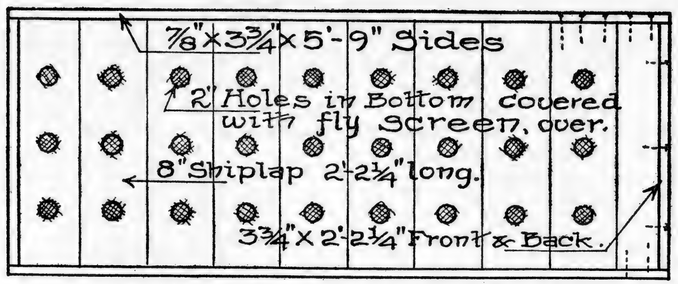
∘ SIDE ∘ ELEVATION ∘

· One · Drawer · pulled · out ·

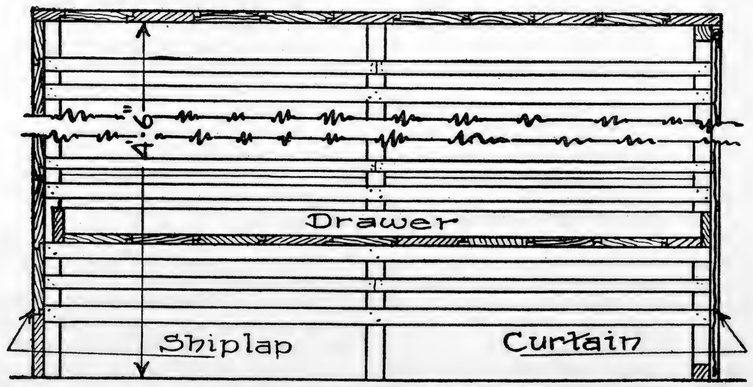


∘ FRONT ∘ ELEVATION ∘

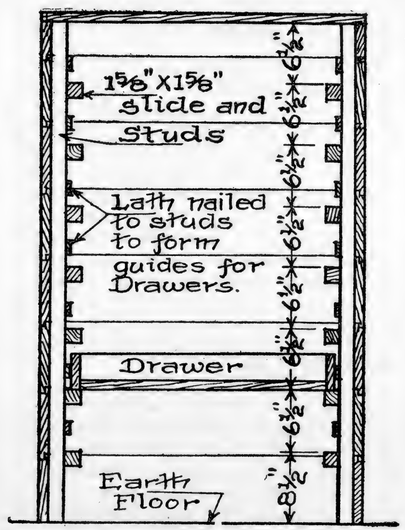
· Canvas · Curtain · Removed ·



∘ PLAN ∘ of ∘ OAT ∘ DRAWER ∘

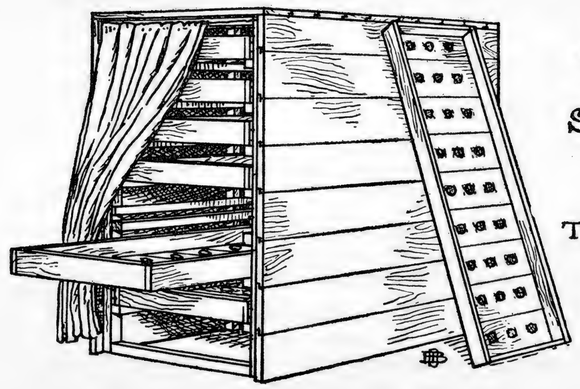


∘ LONG'T'D'L ∘ SECTION ∘



∘ CROSS ∘ SECTION ∘

· Sections · show · one · Drawer · with · spaces ·
· for · six · more ; total · of · 7 ·



∘ THUMB ∘ SKETCH ∘

· One · Drawer · pulled · out ·

KELLERSTRASS PLAN
OF
SPROUTED OATS BIN
AS IT IS BUILT ON
THE KELLERSTRASS FARM
KANSAS CITY, MO.

Scale 12 in. 1 ft.

PLATE · I ·

SPROUTED OATS BIN

IN GENERAL.

The size of this Spouted Oats Bin can be varied and the drawers made smaller or larger. The size illustrated in the Drawings is ample to take care of 28 or 30 brooders, feeding one drawer per day.

This bin is built with seven drawers, with the idea in mind to feed and fill one drawer per day, giving seven days for the oats to sprout in, so by marking them Sun., Mon., Tues., etc., you will have one drawer for each day of the week. If you find it necessary in your locality to give eight days to sprout the oats, you can very easily build one more drawer and put in a couple of slides and guides in the bottom space shown in the Drawings, and thus get in the extra day. Of course, this will necessarily change the markings of the drawers, from the weekly way to some other method, which will be left to your own ingenuity.

BILL OF MATERIALS.

216 sq. ft. 1x8 in. shiplap, 12 ft. lengths, 27 pieces.
40 sq. ft. 2x4 in. dimension, 12 ft. lengths, 5 pieces.
37 sq. ft. 1x4 in. boards, 16 ft. lengths, 7 pieces.
30 laths or 84 lin. ft. of other ¼ to 5-16x1½ in. strips in 12 ft. lengths.
5 ft. of 36 in. wide medium weight canvas.
5 ft. of 36 in. wide copper or galvanized fly screen.
4 ft. of common wire.
2 eyelets, small.
½ dozen carriage knobs or buttons.
4 lbs. 8 penny (d) nails
3 lbs. 16 penny nails.
½ lb. 3 penny nails.
2 boxes small tacks.

HOW TO PROCEED WITH THE WORK.

For the sides take eight pieces of the 12 ft. shiplap and cut into sixteen 6 ft. lengths. Then take two of the 2x4s and rip them in half, and cut out of these 2x2s or 1⅝x1¾ in. (actual measurements) strips, six lengths 4 ft. 6 in. long.

Now lay three of the 4 ft. 6 in. pieces on a level, solid place, laying them all parallel and about 2 in. apart. Take one of the 6 ft. pieces of shiplap and place it over the lower ends of these, and nail fast to the 2x2 in. pieces, which will form the studs. The stud, that will be the rear stud, is to set 13-16 in. in from the end of the piece of shiplap, and the stud at the other end, the front, is to set about 1½ in. in from the end of the piece of shiplap, and the middle one is to set in the center between these two. When they are properly spaced and have their ends all even and are all perfectly square and parallel with the flat or broad side in contact with the shiplap, nail solid. Then nail on the remaining seven pieces of shiplap for that side, keeping the ends all even, in a perfectly straight line and lapping all correctly, using 8d nails.

Nail up the other side in the same manner, but be sure to get it the reverse, so it will set properly when they are set up. Then after all is solid rip off the propecting part of the upper pieces of shiplap, so the walls will be just the height of the studding, or 4 ft. 6 in.

Before raising the sides, put on the slides for the drawers. For these take the three 2x4s left and rip into 2x2s, and then cut these, and the two pieces left from cutting the studding, down to fourteen 5 ft. 9 in. lengths. Nail these fast on each side, as indicated on the Drawings, setting them at the heights and distances apart marked on the Cross Section and on the Front Elevation. Be careful to keep them all perfectly parallel and to keep the opposite ones exactly at the same height, so the drawers will set level. Nail these on with the 1⅝ in. face toward the studs and using 16d nails, nailing solidly, so that the drawers will not come down.

While working at this part of the Bin, put in the laths or the 5-16 in. strips for the guides, as shown in the Drawings. Nail these in place solidly with the 3d nails and the side walls are complete, ready to raise.

Now raise the sides, after first having cut three 2 ft. 10 in. lengths off of a piece of shiplap, and then set the sides so that the measurements from inside to inside of the shiplap will be 2 ft. 8 in., as marked on the Ground Plan, and nail the 2 ft. 10 in. pieces, two on top and one about 18 in. from the ground, in the rear, to hold the sides in place.

Now cut eight 2 ft. 8 in. lengths of shiplap and nail in place on the back, keeping it on line with the side shiplap and ripping the top piece off, so it will be level with the other pieces. Keep it square and straight, so the sides will be level and on a line. The 2 ft. 10 in. piece is to be removed when the 2 ft. 8 in. pieces are placed in position.

Take a couple of pieces of the 2x2s left and cut two lengths 2 ft. 4¾ in. to go between the studs across the front, at top and bottom. Fit these in so that the sides will be exactly 2 ft. 8 in. apart, as above mentioned, and then toe-nail in place solidly.

For the top cut eleven 2 ft. 10 in. lengths of shiplap. These can be a ¼ or ⅜ in. shy of 2 ft. 10 in., so that their ends will be flush with the outside face of the side shiplap. Place these on top and nail them on solidly, after planing the rebate off of the front piece, and ripping the rear piece off, to fit as shown on the Drawings.

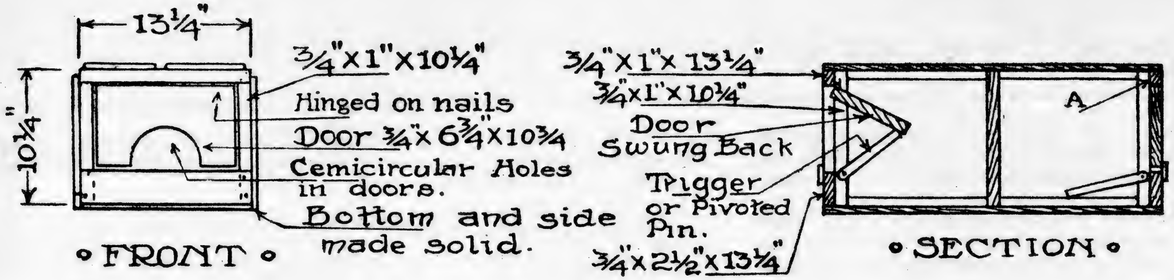
You are now ready for the drawers, so take the remaining fourteen pieces of shiplap and cut five 2 ft. 2¼ in. lengths out of each. If you cannot get the pieces the full 2 ft. 2¼ in. in length, make them as near it as possible, making ten pieces exactly the same length for each drawer, which makes a total of seventy pieces. Now take the 16 ft. 1x4 in. stuff and cut each into two 5 ft. 9 in. lengths and two 2 ft. 2¼ in. lengths, making a total of fourteen pieces of each length. Make each pair, of two, of the shorter lengths, exactly the same length as each set of ten pieces of shiplap, so all will fit in a workmanlike manner. The edges of the 1x4 in. pieces are to be smoothed up, if they are not so already.

Now nail up the 1x4 in. pieces, placing the 2 ft. 2¼ in. pieces between the 5 ft. 9 in. pieces, as shown on the Plan of the Drawer, and nail together securely, making the distance between the sides 2 ft. 2¼ in., or nearly so. Now place the shiplap pieces between, fitting them in tightly, but not bulging the sides. When the bottom side of the shiplap is flush with the edge of the 1x4 frame, nail all solid. Nail up all seven drawers in this manner, using 8d nails, so they will be firm and solid.

Now mark off the holes in the bottom, as shown on the Drawer Plan, and with an extension bit bore the 2 in. holes as shown, and then cover them with galvanized or copper fly screen, to hold in the oats, tacking the screen fast with the small tacks provided. The galvanized or copper screen is used to prevent corrosion as long as possible. When these holes are covered, the drawers are ready to be slipped in place.

Now take the 3x5 ft. piece of canvas and hem the sides and the top edge, making the fold at the top for the wire to pass through; making the canvas a little over 2 ft. 8 in. wide and about 4 ft. 6 in. long. Screw or drive in the carriage knobs or buttons, as shown on the Front Elevation. Put in a couple of eyelets near the top. Pass the wire through the upper fold and secure it to the eyelets. Cut the holes for the buttons in the canvas, and hem them, if you wish, and the Bin is ready.

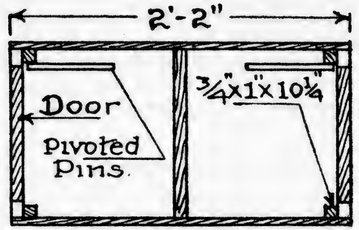
The Bin is now ready for use, unless you wish to paint same. It would be a good idea to paint or whitewash the outside and inside of the case, but let the drawers go without painting or whitewashing, for it might peel off and get into the feed. When the paint or whitewash gets dry, and the drawers are marked so you can distinguish one from the other, the Bin is ready to be used for sprouting the oats.



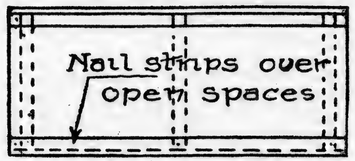
• FRONT •

• SECTION •

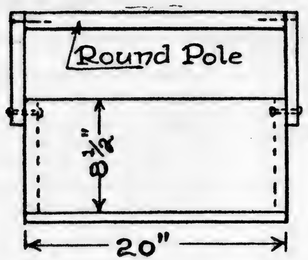
All orange Boxes are not the same size as the one here shown, therefore measure the box used and make lengths etc according to same.

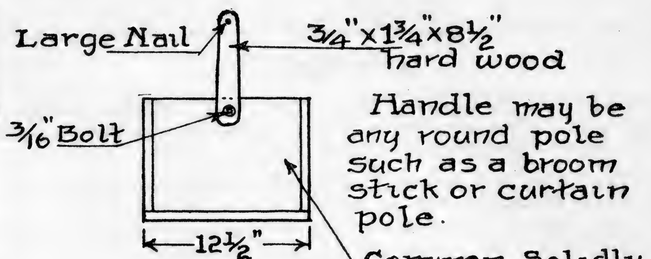


• PLAN •

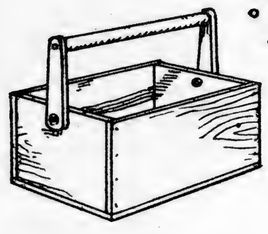


• SIDE •

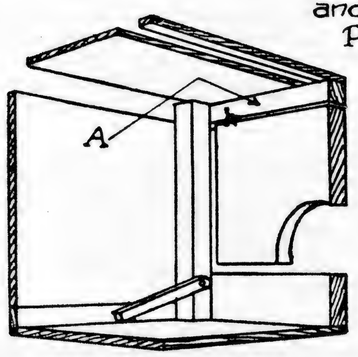


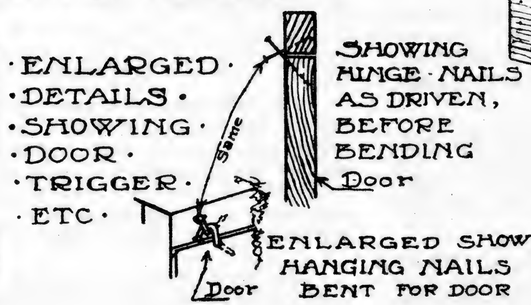


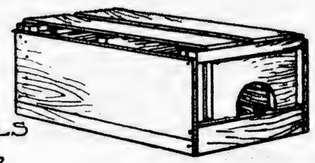
• DROPPING • BOX •
• Used • for • gathering • droppings • in •



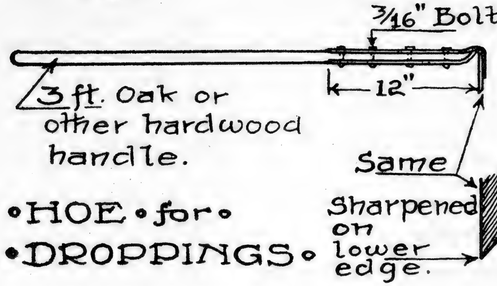
Original ends to be removed and replaced as here shown. Partition remains.



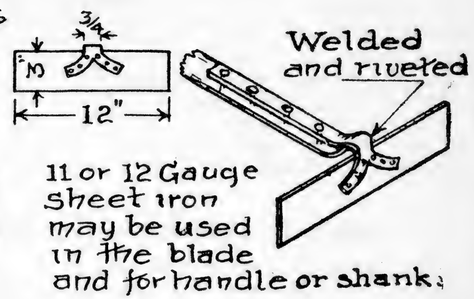


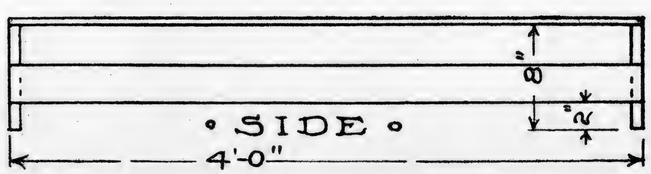


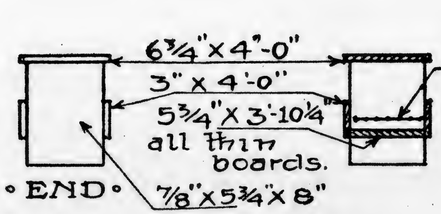
• ORANGE •
• BOX •
• TRAP •
• NEST •

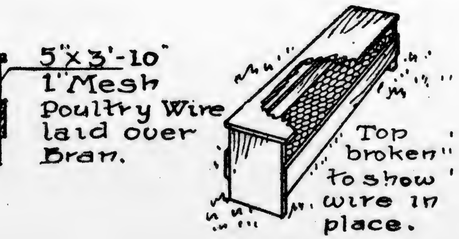


• HOE • for •
• DROPPINGS •









• LARGE • SIZE • BRAN • TROUGH •

KELLERSTRASS
POULTRY APPLIANCES
AS THEY ARE BUILT ON
THE KELLERSTRASS FARM
KANSAS CITY MO.

Scale 12in 0 1ft

PLATE • I •

POULTRY APPLIANCES

IN GENERAL.

The Appliances illustrated on Plate I and Plate II are all of practical use and each one is so thoroughly detailed that only a short description, telling what materials are needed and how to go about the work, will be given of each. The material for the most of them can be picked up around your place, or purchased at very small expense.

The descriptions of the several articles will be given in the following order: Orange Box Trap Nest; Dropping Box; Hoe for the Droppings; Large Size Bran Trough (these illustrated on Plate I), and Medium Size Bran Trough; Small Size Bran Trough; Feed and Water Protection; Common Wood Feed Trough; Feed Hopper; Sheet Metal Feed Trough; Trough for Brooders; Tin Can Hopper (these illustrated on Plate II), and Tin Can Drinking Fountain (not shown on either Plate).

ORANGE BOX TRAP NEST.

This Trap Nest is illustrated on Plate I, and, as the name implies, is made of a common orange box, so all the material you will need is the orange box, some nails, a piece of $\frac{7}{8}$ in. board, to get the four corner strips out of, and some pieces of lath or some thin box lumber.

You will possibly find that the orange box you have provided will not be exactly the same size as the one shown on the Drawings, so in cutting the different pieces necessary, measure the box for all of them instead of using the measurements on the Drawings.

First take the box apart, so you can get the two ends out, and then nail the sides and bottom back on to the central partition again solidly. Take the two ends and rip a piece $2\frac{1}{2}$ in., or a trifle over, off of them on the lower side, and a piece 1 in. wide off of the tops. These two latter pieces are for the pieces marked "A" on the Drawings. Now take the extra piece of $\frac{7}{8}$ in. board and cut four strips about 1 in. in width, and the same length as the box is high, to be used for the upright corner pieces. Take these and nail them fast to the $2\frac{1}{2}$ in. bottom pieces, as shown on the Drawings, and then place these three-sided frames in the ends as indicated, and nail the sides and bottom fast to them. When these are solid, take the extra pieces of thin box lumber, or pieces of lath, and close up the bottom and the cracks at the sides, so they will be tight.

Now take the top boards and the two 1 in. pieces "A," cut off the top of the ends and nail them together, the 1 in. pieces serving as cleats on the ends as indicated on the Drawings. If you wish to have a loose or removable top or cover on the nest, do not nail these pieces or cleats fast to the ends of the corner pieces, but let the top set down over them, the cleats serving to hold the cover in place; but if you wish a solid top, these pieces can be nailed on to the end frames, and the top boards nailed on to the partition and ends both.

When the top is fixed either way, removable or solid, to suit your ideas, take the pieces left from the ends and cut them so they will fit for the doors, as shown on the Drawings, cutting them off so there will be a little play all around them, and cutting the semi-circular hole in the lower part as shown. Now on the inside of the door and in the pieces "A" drive four nails for the hanging nails, driving them as shown on the Details, and then bend them as shown, so the doors will hang on them. These nails being used instead of hinges. The little tilt inward of the doors will do no harm.

Now whittle out a couple of sticks for the pivoted pins or triggers and nail them in as shown, making the holes through which the nails pass large, so the pin will swing loosely on the nail. These pins to be of sufficient length to hold the door up as shown. When the doors are thus set, the nest is open, and when the hen enters, she lifts the door slightly, which releases the pin and allows the door to drop down, closing the nest. The way the door is hinged prevents it from swinging out.

When this is all done in a workmanlike manner, the nests are ready for use. But, before using, it would be a good idea to coat them with kerosene, creosote, or some such lice destroyer and wood preserver. If you only desire one nest, cut the orange box off in back of the partition. It would be a good idea to close up the top, as well as the bottom of the nests, so the hen will have a dark place to lay in.

DROPPING BOX.

This Box, which is used for gathering and carrying away the droppings, is illustrated on Plate I, and, as shown by the Drawings, is made of a common box, a couple of pieces of hard wood, a round pole, and a couple of nails and bolts. The bolts can be replaced by nails or common screws, screws being the best.

Any common box will do that has solid sides and bottom, so the droppings will not fall through, and that is not too large to carry. A convenient size would be about as shown on the Drawings. Take the pieces of wood, and cut them to the size and shape shown, and bore a hole near the large end in each, for the bolts or screws, whichever you use, and make a hole in the top for the nails, or you can use screws here, also, which would make a very good job. The round pole can be a broomstick, curtain pole, or you can plane or whittle any pole down until it is about round, and about $1\frac{1}{2}$ in. in diameter. This pole is to be the same length as the box.

Secure these pieces together as shown on the Drawings, using the bolts and nails or using the screws. Be sure and get the bolts and screws through the wood pieces exactly in the center of the ends of the box, so the box will balance properly. Paint or coat this with creosote or crude carbolic acid, and it is ready for use.

HOE FOR DROPPINGS.

The Hoe is used for scraping the droppings off of the dropping boards, and is shown on Plate I. It needs to be heavy and strong, for in freezing weather it is difficult to loosen the frozen droppings.

The head of this Hoe, which is to be of wrought iron or steel, can be made by any blacksmith, and you can insert the oak or other hardwood handle yourself, using the handle off of some discarded hoe, shovel, pitchfork, or something like that, or make it yourself out of a piece of hardwood lumber.

The blade is desirable of sheet steel, although sheet iron might be all right. It is to be about 11 or 12 gauge metal, and sharpened on the lower edge, which is to be perfectly straight; the top may be rounded, if you so desire. The shanks can be made of about the same gauge metal, and it would be desirable to round them to fit on the rounded handle. They are to be welded together where they come in contact, and then spread out and riveted to the blade. Then bore the holes in the shanks for the bolts, using countersunk bolts.

When the head is done, fit the wood handle in between the shanks, bore the holes through it, and secure it with the bolts, and you have the best Hoe made for the purpose it is to be used.

LARGE SIZE BRAN TROUGH.

This Trough is shown on Plate I, and is built nearly entirely of thin boards, which can be about $\frac{1}{2}$ in. thick. It will take two 6 in. and one about 7 in. thin boards 4 ft. long, and two pieces of $\frac{7}{8}$ in. boards $5\frac{3}{4}$ in. wide x 8 in. long, and a few nails to build the trough, and then you will need a strip of 1 in. mesh poultry wire that is 5 in. wide x 3 ft. 10 in. long.

Take one of the 6 in. boards and rip it in half, and nail these two 3 in. pieces on the sides of the 8 in. blocks, as shown on the Drawings. Then fit the other 6 in. board between the ends, and the 3 in. boards for the bottom, and nail it solidly in place, nailing through the side boards into it. When this is tight, set the 7 in. or $6\frac{3}{4}$ in. board on top, and nail it fast, letting it project over each side equally.

Now cut the poultry wire, so it will fit all right, and bend or file off the pieces of projecting wire, so the poultry have no chance to injure themselves, if they attempt to scratch in the bran.

Place the bran in the trough, Then the wire in over the bran. The wire is to keep the chickens from scratching the bran all out on to the ground, and the cover on the top is to keep them from roosting on the trough, and to keep the droppings from getting into the feed.

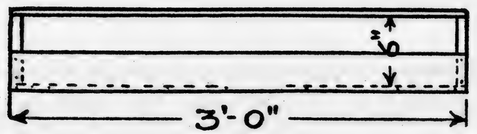
MEDIUM SIZE BRAN TROUGH.

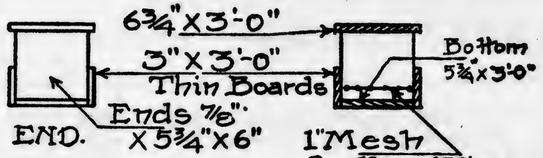
This Bran Trough is considerably smaller than the previous one, and is illustrated on Plate II. This is made out of the same kind of material as the other one. Get two pieces of $\frac{1}{2}$ in. lumber, 6 in. wide and 3 ft. long, and one piece about 7 in. wide of the same length, then there will be two blocks or pieces of $\frac{7}{8}$ in. board about $5\frac{3}{4}$ in. wide and 6 in. long, and some nails, and a strip of 1 in. mesh poultry wire, 5 in. wide x 2 ft. 10 in. long.

Take one of the 6 in. boards and make it the same width as the blocks of $\frac{7}{8}$ in. pieces, which are for the ends, and then nail the $\frac{1}{2}$ in. board on the ends for the bottom. Rip the other 6 in. board in half, and nail the 3 in. strips on to the sides, nailing into the ends and into the edge of the bottom piece. Then put the top on, using the wider piece of board, and nail all solidly.

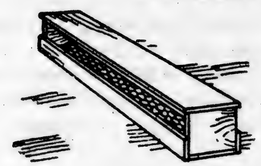
Fix the poultry wire properly, so there will be no projecting pieces of wire, and then place the bran in the trough, and the wire over it, and the trough is ready for use.

This trough is recommended for use on floors and in dry places, and the larger one, the bottom of which is raised up, for use where the grass or ground is moist or wet.

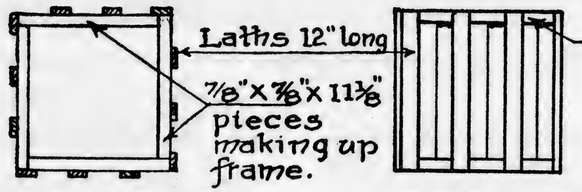




•MEDIUM•SIZE•BRAN•TROUGH•



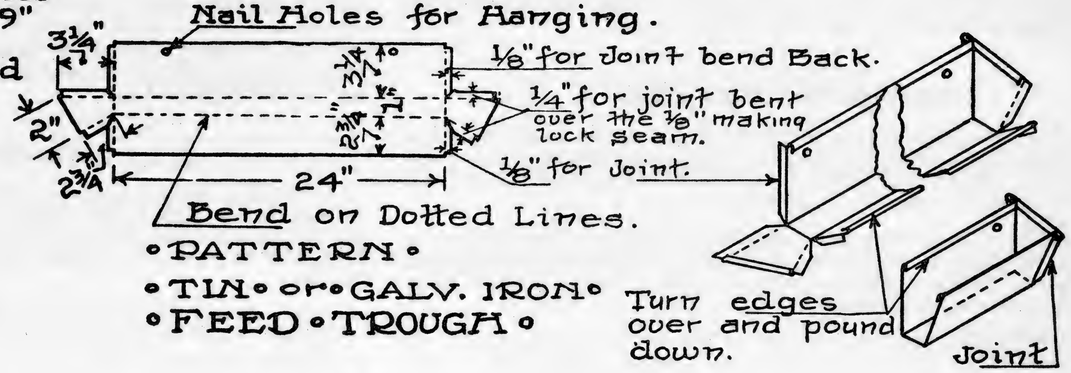
Small Size Bran Trough to have 2" side boards and 4"X4" ends with top and bottom of proportionate size. Construction same as above.



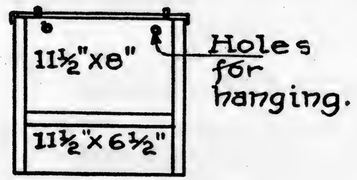
•PLAN• •ELEVATION•

•FEED•&•WATER•PROTECTOR•

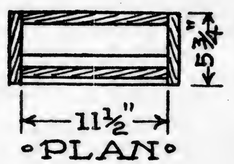
•FRONT• •SIDE• •SECTION•



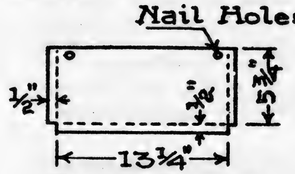
•PATTERN•
•TIN• or •GALV. IRON•
•FEED•TROUGH•



•BACK•

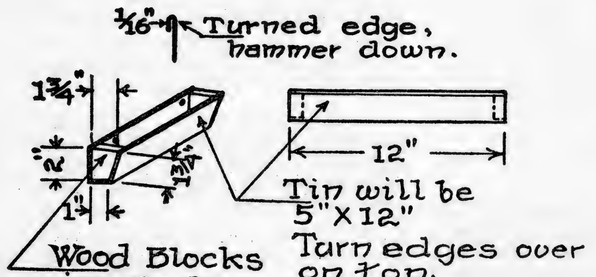


•PLAN•

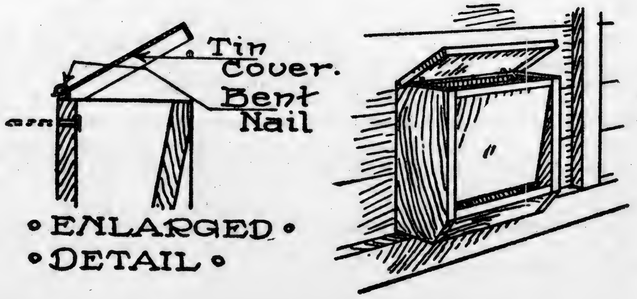


Bend Down
on dotted lines.

•PATTERN•for•
•TIN•COVER•

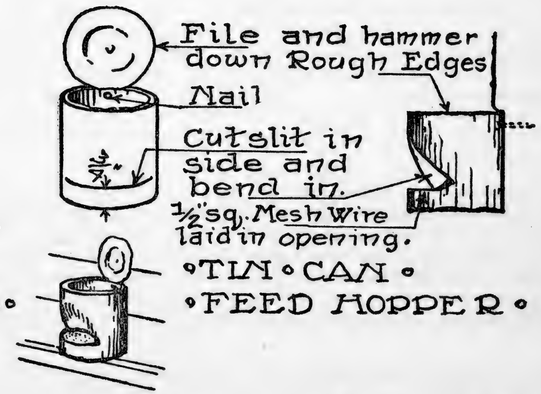


•TROUGH•for•BROODERS•



•ENLARGED•
•DETAIL•

•FEED•HOPPER•



•TIN•CAN•
•FEED HOPPER•

KELLERSTRASS
POULTRY APPLIANCES
AS THEY ARE BUILT ON
THE KELLERSTRASS FARM, KANSAS CITY, MO.

Scale 12 in 1 ft

PLATE •II•

SMALL SIZE BRAN TROUGH.

The small size Trough is not detailed on either Plate, but is covered by a Note on Plate 11. The construction is to be the same as for the medium sized trough. The lumber ought to be thinner than ½ in., if you have some that is thinner. For this, get two boards 4 in. wide and one about 4¾ in. or a trifle less, which are to be about 2 ft. long, and two end pieces 4x4 in. and a piece of square mesh wire that will be about 3½x22 in. and a few small nails.

Proceed to build this exactly in the same manner as described for the medium sized trough, except that the sizes are different. This small trough makes a nice one for the smaller chicks that are able to forage for themselves.

The length of any of these troughs may of course be varied to suit your needs.

FEED AND WATER PROTECTOR.

This Protector, illustrated on Plate II, is a very simple though very useful contrivance, and is made of a 12x12 in. piece of ⅞ in. board, four ⅞x⅞ in. x about 11⅛ in. long strips, twelve pieces of laths 12 in. long, and some nails.

Your 12 in. board will probably not be quite full 12 in., but whatever it is, make it square. Then take the ⅞x⅞ in. strips, and placing them end to side, as shown on the Plan, make them of such a length so the square thus formed, will be exactly the size of the square board, and then nail the pieces together solidly. Now smooth up the 12 in. lengths of laths a little, and nail them in place as shown on the Drawings. This will make pretty wide spaces, that will be suitable for the larger Poultry, but if you desire to use the Protector for the younger chickens, put more slats on, always spacing them equally. This way you can easily regulate the openings for the different sized and aged chicks.

When all is nailed up properly, it is ready for use, so place it over the pan or vessel containing water or food, and the poultry cannot get into it to scatter it all over, spoiling the water and wasting the feed, as is generally done when the food is set out in the open.

COMMON FEED TROUGH.

This Trough is the common old-fashioned V-shaped one, which we all use. It is illustrated on Plate II. For this, take some ½ or ⅝ in. lumber about 5½ in. wide, and cut two pieces 9 in. long for the ends, and cut two more pieces, of the length you desire to make the Trough.

Take one of these long pieces and plane or rip a ½ in. off of it, if the boards are ½ in. thick, or take ⅜ in. off of it, if you have that thickness of lumber. Then place the two pieces together, the wider piece lapping over the narrower piece, so both sides will be the same, and then nail together. When these are tight and the ends square and flush, nail on the end pieces, and the Trough is ready for use.

FEED HOPPER.

This Hopper, as it is shown on the Drawings on Plate II., is made of ⅞ in. lumber, with a tin top or cover. If you use thinner lumber, which would be just as good, the sizes will change a little.

For the one detailed, cut out of ⅞ in. lumber, two pieces 5 ¾in. wide x 12 in. long for the sides, one piece 11½x10½ in. for the front, one piece 11½x2¼ in. and one piece 11½x6½ in. for the hopper bottom, and one piece 11½x8 in. for the back, and provide a piece of tin about 14½x6½ in.

Take the different front and bottom and back pieces, and draw or lay them out on one of the sides, as shown on the Section, to get the several different bevels, and then with a saw and a plane, bevel each piece, until the whole fits in a workmanlike manner, and then nail together. You should have no trouble in getting the bevels right, if you lay it out on the side first.

After the wood part is nailed together, and everything is flush and neat, per the Drawings, take the piece of tin provided, and cut it to the shape shown by the Pattern, and then bend the edges down over the top as indicated. Then punch a couple holes along the back edge, for the bent nails forming the hinges, and drive these in, and bend them into the shape shown, so all will work properly.

When this is done, the Hopper is ready for use, so nail it up in place on the wall of one of your Poultry houses, and fill it with feed, which ever kind you contemplate using, and it is ready for the chickens.

SHEET METAL FEED TROUGH.

This Feed Trough is shown on Plate II, which shows the pattern and manner of bending the sheet metal. The best metal for this Trough is galvanized sheet iron, although tin will do in an emergency. The size of the sheet necessary is about 2 ft. 7 in. long x 7 in. wide. The length can be made less or more than shown on the Drawings, if you so wish.

Lay out the pattern or the lines to cut to, etc., as shown on the Drawings, being sure to get both ends exactly alike, and to cut the little notches, etc., for the laps as shown.

When this is all cut out properly, as indicated on the Drawings, turn forward the edges left along the top on both sides and both ends and pound these down, so as to have a rounded top edge on the Trough. Then turn back the ⅛ in. laps on the front and back, and then turn the front and back and the ends up as shown, and when these are all turned up properly, bend the projecting ⅛ in. of the ends, around over the laps of the front and back, and then bend the whole of the joints thus made over against the front or back, hammering it down solid, making a lock-seam joint, which will be good and tight and solid.

In doing this bending or turning, be sure and make every bend perfectly square or straight, or else you will have a bungled up job, even if the metal was cut correctly. If the joints are made in a workmanlike manner, it will not take much to make this Trough waterproof, perhaps only a drop of solder in each corner will be enough. For ordinary feed, it will be tight enough with almost any kind of joints.

When the Trough is formed in its proper shape, punch a couple holes that will allow a nail head to pass through, in the back, and drive a couple nails, in the side, of whatever you wish to use this Trough in, at the proper height, and hang the Trough up on these, and it is ready for use.

TROUGH FOR BROODER.

This is a small combination sheet metal and wood Trough, and is shown on Plate II. This can also be made, same as the longer sheet metal Trough, but for dry foods, the wood ends will be as good as any.

For this, cut two small blocks of ¾ or ⅞ in. lumber into the shape shown on the Drawings, which gives all dimensions. Then take a piece of tin, that is 5 in. x 12 in. in size, and turn the 12 in. edges over, as shown in the Detail, hammering them tight along the lower edge, and leaving as large a round on top as possible, and then bend the tin over the blocks and tack fast, the blocks being placed in each end.

When this is tacked solid, punch the holes in the back for the hanging nails, and file off any sharp edges around the ends, and smoothing all up, so the chicks cannot injure themselves. Then hang it on the side of the Brooder, so the bottom is about even with the ground or floor, and fill it with feed or grit, and let the chicks at it.

TIN CAN HOPPER.

This Hopper is shown on Plate II and is to be made of a common tomato or other tin can about that size. About ¾ in. from the bottom, cut a slit, not quite half way around the can, and then bend the upper part in as shown, until it comes about level with the front, then file the front edges off, or better still, bend a little of the edge over, so there will be no sharp edges to harm the little chicks, then file off the sharp edges of the top and cover, and drive a nail in at the side as shown to hang it on, and it is ready for use.

To keep the chicks from scratching the feed all out, put a piece of ½ in. square mesh wire over the opening, laying it over the feed, all as marked on the Drawings.

TIN CAN DRINKING FOUNTAIN.

The Drinking Fountain is not shown on either of the two Plates, but is so simple to make, that this description, will be sufficient.

Take a common tin tomato or baking powder can, and cut the top out flush with the edge, and then about ½ in. from the edge, punch a small hole with a spike. Then get a shallow pan that is a little over ½ inch deep, and is about 2 in. larger in diameter than the tin can.

Now fill the tin can full of water, up to the hole, place the pan upside down over it, and then turn over quickly, and the water will run down filling the pan around the edge until it covers the hole in the side of the can, and then stop, leaving ½ in. of water in the pan all around the can. The pan will always have that much water in it until the can is empty. This completes your Fountain, making it ready to set out before the chicks.

THE

KELLERSTRASS WAY

OF BUILDING

Poultry Houses and Appliances

RIGBY PRINTING COMPANY
KANSAS CITY, MO.